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ORIGINAL CONTRIBUTIONS

"NERVOUS BREAKDOWNS"

THEIR NATURE, CAUSES AND PREVENTION*

LEWELLYS F. BARKER, M.D., LL.D.

BALTIMORE, MARYLAND

People who have never known what it is to be nervously or mentally ill, who have never experienced any serious difficulty in responding adequately to the situations of life in which they have found themselves, have, as a rule, but little conception either of the nature, or of the prevalence, of so-called "nervous breakdowns." They are not always sympathetic with those who suffer from them and they are far too prone to ascribe the "incapacities" of the sufferers to wilful negligence or to blameworthy moral obliquity. "Think right, feel right and act right," these healthy people say, "and you will have no nervous breakdowns." This statement, though true, disregards the fact that certain persons in certain environments *can not* think "right," or *can not feel* "right" or *can not* act "right;" their thinking, their feeling and their acting indicate failures of adjustment of their personalities to their surroundings, failures of adaptation that the trained medical man recognizes are beyond their unaided powers to avoid. The maladjustments are evidences of temporary or permanent lack of the powers necessary for adequate biologic responses to situations; they are signals that call in a given case for the investigation of both personality and environment in the hope that through influences that can modify the one, the other, or both, the means may be found for ensuring a more efficient, a happier and a socially more useful life.

As a result of the studies of a great many people who have broken down "nervously and mentally," medical men have gradually come to a better understanding of the nature of these "breakdowns;" they have learned something of their causes and, basing their plans upon a knowledge of these causes, they have begun to devise methods for preventing them. Though the matters involved in such studies are tremendously complex and abstruse, still there have been disclosed a number of facts and a few principles that can be presented in a fairly simple way. It is to some of these facts regarding the nature and the causes of nervous breakdown and to some of the more important principles of prevention that I desire to direct your attention this evening.

VARIETIES OF NERVOUS AND MENTAL BREAKDOWN

The average layman, who hears that John Doe or Susan Roe has gone to a hospital or a sanatorium because of a "nervous breakdown," has no idea that this may mean any one of a whole series of different nervous and mental disorders. A "nervous breakdown" is, to the ordinary layman a "simple nervous breakdown," and "it is nothing more."

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* Presented at the University of Washington Postgraduate Medical Lectures, Seattle, Wash., July 20-24, 1925.

The physician, on the other hand, is aware that by the designation "nervous breakdown" may be meant (1) a *psychoneurotic state* (for example, a neurasthenia with insomnia, fatigability, and inability to concentrate; a hysteria with functional paralysis or convulsions; an anxiety neurosis with apprehension, palpitation and restlessness; or a psychasthenic state with doubts, fears, obsessions and lack of power of making decisions); (2) an *outspoken psychosis* (say a manic-depressive psychosis with symptoms of melancholia or of mania; or a schizophrenic psychosis with its "visions," "voices" and feelings of being "influenced" that may end in a precocious dementia; or a paranoia with ideas of persecution); or (3) an *organic disease of the nervous system* (say a cerebral apoplexy, a general paresis, a sleeping sickness, or a brain tumor). Moreover, doctors know that there are also "nervous breakdowns" that are treated not in ordinary hospitals, nor in sanitaria, nor in "asylums for the insane," nor in "neurologic institutes," but in still other institutions, among which may be mentioned epileptic colonies, almshouses, jails, penitentiaries, houses of correction, and various other places for the detention, care and training of *"defectives"* or *"delinquents."*

In all of these "nervous breakdowns," the patients are, for the time being, unequal to the demands of ordinary life. They are incapable of making suitable responses to the environmental stimuli that impinge upon them. They are, temporarily, sometimes permanently, "misfits" in family life, in school life, or in the larger world of society and of economic struggle. As a consequence, they must, for a time at least, for their own sakes and for the sake of others, be transferred to conditions of existence that are simpler, more circumscribed, and more closely supervised than those in which more "healthy" persons may safely be permitted to think, to feel, and to strive.

Further, in every population, as medical men know very well, there are numbers of persons who, though not completely "broken down" nervously or mentally, are in states that might, perhaps, be designated as *"partial breakdown" or "semiresponsivity."* These "semiresponsive" persons, whose mental and physical resistance is constitutionally diminished and who exhibit a lack of harmonious equilibrium of the mental and moral functions, may be of any age or station. Among them may be included many who believe that they are "well" and whom others may not recognize as "ill." I may mention as examples (1) in the preschool age, the children who through lack of "self-control" present "behavior problems," (2) in the school age, those who cannot keep pace with their fellows and have to be taught in "special classes" and those who because of "bad conduct" cannot be kept in the schools, and (3) in later life, a whole series of abnormal personalities: the lazy, the delicate and often refined people who "enjoy poor health," the eccentric, the moody, the crassly egoistic, the hostile misanthropic, the preternaturally shy or seclusive, the ne'er-do-wells, the tramps, the prostitutes, the drunkards, the drug-addicts, the quarrelsome, the divorce-producers, the litigious, the quacks, the fakirs, the perverse, the fanatically religious or antireligious and the antisocial. Many of these "semiresponsive" persons never enter an institution for treatment; they are often, however, grievous burdens not only to families but also to communities and to society in general.

In all of these many forms of total "nervous" breakdown and of partial-breakdown the psychic functions are disturbed. In some of them it is the "intellect" that is most involved; in others—probably in the majority—it is what is often spoken of as the "character" (depending upon the feeling-tone, the emotional control and the power of "will") that is disordered and accounts for the lack of adequate responsivity; in many both "intellect" and "character" are simultaneously more or less disorganized. In all of them, as Dr. Charles Macfie Campbell has well said, we have to deal with *human nature working under difficulties,* with men, women and children in trouble—"suffering, hoping, thwarted, groping."[1] In other words, *"nervous breakdowns" of all degrees are, in reality, also minor or major mental disturbances.* In their study and treatment this fact should never be lost sight of.

CAUSES OF NERVOUS BREAKDOWNS

One of the great advances of our time lies in the growing acceptance of the view that all the manifestations of living creatures are subject to natural laws, just as definitely as are occurrences in those parts of the world that are nonliving. Physiologists have shown us that the way the heart beats, the way we breathe, the way we digest, the way we excrete, the way our muscles contract, and the way we see, hear, smell and feel can be analyzed by exact methods that reveal the existence of delicate mechanisms, whose workings are remarkably uniform under the same conditions, though they undergo characteristic alterations with changes in those conditions. Pathologists have demonstrated that the altered behavior of the organs of the body in disease are also subject to governing laws that they are gradually discovering. Psychologists and psychiatrists through their careful studies are accumulating evidence that strongly favors the view that, similarly, *all thinking, all feeling and all striving are inevitable sequences of preceding series of events;* they are among the functions of living organisms reacting to environmental conditions.

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[1] Campbell, C. M.: A Present-Day Conception of Mental Disorders. Harvard University Press, Cambridge, Mass. 1924. 54 pp.

What a given living organism—whether it be plant, animal or man—is at any given moment, seems to depend upon two groups of fundamental factors—a group of *factors in the germ plasm* from which the organism started and a group of *environmental influences* (physical, chemical and psychical) that have impinged upon it since it started. If this be true, a complete knowledge of the factors of heredity and of the factors of the environment of given persons and a full acquaintance with the modes of reaction of hereditary factors with environmental factors would supply the data for explaining the constitutional make-up of those persons and the character of their responses in a changing environment.

Through inheritance each human being is supplied with a large series of possibilities of development; which of these potentialities for good or for ill in development shall come to realization in a person will depend upon the series of influences from the surroundings that successively act upon the fertilized egg-cell and upon its derivatives from the moment of conception onward. This law of nature would seem to be valid not only for the form and functions of the several *parts* of the body, but also for the behavior of the person as a *whole.*

The physical health and the mental health of human beings would appear, therefore, to be definitely determined; similarly, we must regard the physical disorders and the mental disorders of man as being definitely determined. The causes of nervous and mental breakdowns must, accordingly, be sought in the factors of inheritance, in the factors of environment, or in both groups of factors.

Such a view is not easy of acceptance by all, for it seems, at first thought, to be in conflict with the tenaciously held doctrine of the "freedom of the will" and with the doctrine of "responsibility of human beings for their behavior." This is neither the time nor the place to enter upon the discussion of definitions of these doctrines or of their relation to ultimate problems. I must leave such discussions to the philosophers and the metaphysicians. But in medicine we are making rapid progress both in the treatment of disease and in the prevention of disease by working on the hypothesis that the symptoms and signs of disease (both physical and mental) that we meet with in a patient are inevitable sequences of an original equipment (or its derivatives) interacting, over a longer or shorter period, with influences in its surroundings.

A special *predisposition* to a disease may be either inherited or acquired; the outbreak of a disease in one who is predisposed to it is usually precipitated by some special environmental stress, though this stress may be one that would be harmless to a person who was not predisposed to the disease. Many persons who inherit a disposition to disease never develop that disease. If disposition to a disorder is believed to exist in a person from what is known of his ancestry, measures that will prevent its development can in many instances be devised. A knowledge of the disease-tendencies of our ancestors and of our blood-relatives can often be turned to our own good account, if we will but heed the warning signals, and place safe-guards at presumably vulnerable points.

That the disposition to nervous and mental breakdowns of the several varieties that I mentioned at the beginning of this address may be transmitted through *heredity* is now very clear. There are some families in which a given type of breakdown is very frequent; even the "healthy" members of those families may show certain nervous and mental deviations from the normal. There are other families in which the same type of breakdown rarely if ever occurs. A tendency to recurring mental depression may be an exquisitely hereditary affair, appearing in each of successive generations (Mendelian dominance). A disposition to dementia precox may be inherited less obviously, behaving more like a Mendelian recessive. The marked influence of hereditary predisposition to such breakdowns has been proven, too, by the study of mental disturbances occurring in "identical twins," that is to say in twins that are believed to be derived from division of a single fertilized egg-cell. The two members of the pair may become ill at the same time and may exhibit very similar symptoms, even though they are not living in the same place. Evidence regarding the mental similarities of identical twins has led Popenoe to the conclusion that "the psychical make-up of the individual is very largely settled at the time that he is born."

Goddard's well-known study of the "Kallikak family" throws much light upon the heredity of certain forms of feeble-mindedness. Martin Kallikak, a young soldier of the Revolutionary War, of good family, during a night of dissipation about 150 years ago, had illicit intercourse with a girl who, though physically attractive, is said to have been feeble-minded. A boy born of this union later married a feeble-minded girl and their offspring have been followed for several generations. Martin Kallikak, on the other hand, married a young Quakeress of talents and of excellent ancestry; and the offspring of this married pair have also been followed through some six generations. Through the lawful wife (of good hereditary strain) there were 496 descendants, *all* or nearly all normal people. All of the legitimate children of Martin, Sr., married into the best families in their state, the descendants of soldiers, lawyers, doctors, educators, judges, founders of universities, Colonial governors, and signers of the Declaration of Independence. But through the feeble-minded girl there were 480 descendants, a progeny characterized by intellectual and characterologic defects; among these descendants there were no less than 143 known definitely to have been feeble-minded persons, 36 born illegitimately, 3 epileptics, 3 criminals and 8 keepers of brothels. The one group of descendants did credit to the country; members of this group seem to have done well in whatever environment they lived. The other group of descendants instead of contributing to public welfare were an economic burden upon society; immense sums have had to be spent in the past one hundred and fifty years to restrain the bad tendencies and to care for the feeble minds and bodies of the derivatives of this ill-fated strain.

Recent studies of families in Switzerland have gone far toward increasing our knowledge of the transmissibility by heredity of disposition both to manic-depressive insanity and to dementia precox; and among the family-trees on file at the Eugenics Record Office at Cold Spring Harbor, Long Island, there are many that illustrate well the significance of neuropathic and psychopathic ancestry. The tendency of psychoneurotic states (like neurasthenia, hysteria and psychasthenia) also to run in families is well known to every family physician; the fact has not escaped the attention, I feel sure, of intelligent laymen also. We shall not go far astray, then, in concluding that, *for a very large proportion of the "nervous breakdowns" of all sorts, an important element in the causation must lie in germinal predisposition, that is to say, in heredity.* Moreover, it now seems probable that instead of a single general predisposition to nervous and mental disorders, we have in heredity to deal with at least *several special predispositions,* corresponding to the several larger groups of "nervous breakdowns" to which I have referred. It will be the further task of students of heredity gradually to ascertain the mechanisms concerned in the inheritance of these dispositions, to see in how far they are Mendelian in mode of transmission, to determine their chromosomal basis in the germ-plasm, to study the effects of in-breeding and out-breeding upon them, and to discover the best methods of eradicating them from human stocks or at any rate of circumventing their malign influences.

Turning next to causes of "nervous breakdowns" that are to be sought in *environmental influences,* it must be remembered that (1) such influences may date back to prenatal life; (2) they may be exerted in infancy, in later childhood, or during adolescence; or (3) they may predominantly affect the person in any one of the several decades of adulthood.

The germ-cells themselves, the bearers of the heredity-substances, are marvellously protected from injury within the bodies of their carriers, but there is reason to believe that such germ cells carrying good ancestral germ-plasm may sometimes be damaged by poisons, by infections, or by debilitating disease ("blastophthory" of Forel). The new being, after its start in germ-cell fusion, is also wonderfully protected within the womb of the mother during prenatal life, but here, too, injuries may sometimes occur to the fetus that are responsible, at least in part, for the origin of nervous and mental disorders. A difficult birth due to a small pelvis, or to other cause, may also sometimes be the cause of an idiocy or of a psychopathy.

After birth improper care and feeding during infancy may entail injury to the brain and be the starting point of serious nervous or mental trouble in later life. In childhood and during early life, especially, failure to comply with the now well-known laws of *personal hygiene* (concerning fresh air, sunshine, balanced diet, water-drinking, proper clothing, properly proportioned rest, exercise, work and play), and lack of training in good and regular *physical, mental and moral habits* are among the important predisposing causes of "nervous breakdowns." Negligence in matters of personal hygiene may be particularly harmful at puberty, at periods of menstruation, during pregnancy, after childbirth, or at the so-called "change of life."

I have been much impressed with the importance of *undernutrition* as a causative factor in the origin of certain nervous breakdowns. A large proportion of the men and women who apply for treatment for "nerves" are from 20 to 40 pounds or more below ideal weight. Many of these persons have never learned how to eat properly; some of them eat too much of some kinds of food and not enough of others; a few of them consume a well-balanced diet but because of a disease of the digestive apparatus or of some metabolic disorder (for example, overactivity of the thyroid gland) still remain undernourished. Not infrequently an analysis of the causes of the undernutrition will point the way to rapid gain in weight and to recovery of the nervous and mental balance. Not all subjects of "nervous breakdown" are, however, undernourished; we meet with psychoneurotic states and psychoses among the obese as well as among the emaciated.

Infectious diseases of various sorts may seriously injure the nervous system and precipitate nervous and mental disorders. Syphilis is one of the worst enemies of the human brain. Another infectious disease that has been prevalent since 1918 and has literally ruined many a person both physically and mentally is epidemic encephalitis, commonly called "sleeping sickness." Even infected teeth or tonsils may be among the causative factors of nervous breakdowns.

Chronic poisoning from alcohol, or lead, or from substances absorbed from the intestine may be very injurious to the nervous and mental functions, especially in persons predisposed to nervous breakdown. It has been estimated that from 20 to 35 per cent of the males admitted to asylums for the insane owe their mental disorders to the abuse of alcohol.

The *stresses and strains* of our everyday life in the present state of Western civilization have become so great that weaker nervous systems are likely to succumb to them. Overambition and the intensity of the economic and the social struggle, "burning the candle at both ends," an insane quest of "pleasures," foolish attempts to put a week of normal life into twenty-four hours of feverish overactivity, the demand for sensational literature and music, for rapid transportation and for violent stimuli of all sorts—all are conducive to aggravation of the "wear and tear" of the nervous system. Changing standards regarding marriage, divorce and the gratification of the sex-instinct play, also, without doubt, a role.

Among the *psychic and social causes* of nervous breakdowns must be included also (1) unsuitable education both in the home and in the schools, (2) emotional influences due to domestic or industrial conflicts, to fright, to loss of money or position, to bereavements and disappointments, or to conditions involving anxiety, discontent and dissatisfaction and (3) situations in which "nervous breakdowns" may be used as weapons to evade responsibilities or to force others to sympathy, desired action or wished for recompense (as in marital infelicity or in damage suits for injuries sustained). Any one of the environmental influences mentioned or several of them exerted simultaneously may be responsible for a nervous breakdown of one sort or another in a person constitutionally predisposed to breakdown.

THE PREVENTION OF NERVOUS BREAKDOWNS

Of the gratifying progress made in the *treatment* of nervous breakdowns in our time I shall not speak, but I desire strongly to emphasize the personal and social importance of spreading a knowledge of the principles of preventing them, to say something of the concrete methods that may be employed, and to comment upon how the work of wide application of the best methods may best be organized.

Some conception of the importance of prevention can be gained by the consideration of a few statistics as to *incidence and cost of nervous breakdowns* due to mental deficiency, to moral delinquency, to epilepsy, to the psychoses and to the psychoneuroses. I shall not burden you with a long list of figures; a few items will suffice to convince you of the magnitude of the problem. Thus, if I tell you that in the year 1919 alone some 250,000 persons were under treatment in hospitals for the insane in the United States at a cost of about 50 million dollars per year, that some 500,000 mental defectives in that country were so badly handicapped intellectually as to necessitate institutional custody, and that, in the same country, each year sees some 500,000 pass through the law courts to enter correctional institutions because of moral delinquencies, you will have the clues for an understanding of the situation. I have not at hand the figures that estimate the cost to society entailed by the lack of productivity of the great numbers of these seriously handicapped persons, by the provision that must be made in custodial and correctional institutions for their maintenance, and by the machinery of medical and legal organizations that deal with them. Add to all this the enormous cost of the care of psychoneurotics in general hospitals, in private sanitaria, and in domiciliary practice and the total annual expenditure because of "nervous breakdowns" becomes truly appalling.

And even more important than the financial side of this huge problem is the amount of human misery involved. Who can estimate the sufferings of these handicapped persons? And who can measure the sorrows and anxieties of their relatives and friends? Surely these calamitous costs and these heart-rending human tragedies should stir us to our very depths and should arouse in us a stern determination to devise methods of preventing them and to see to it that, as soon as such measures can be devised, they shall be systematically applied!

The *principles of prevention* must have become clear to you when I discussed the causes of nervous breakdowns. These obviously must refer to (1) the control of inheritance and (2) the control of environment. If we are to prevent "nervous breakdowns," we must then (1) ensure, as far as possible, to each new human being an inheritance that will promise psychophysical resistance, and (2) protect each new creature (from the time of its start in a fertilized egg-cell through the period of its development and through its maturity) from environmental influences that are too harmful to it. The principle of providing for good inheritance is the "eugenic principle"; that of providing a suitable environment is the "euthenic principle." *In eugenics and in euthenics lies the hope of the race.* Neither discipline will by itself, despite the protests of overenthusiastic advocates, suffice; both are of very great importance.

But such generalities, helpful as they are for the comprehension of the problem in its broad aspects, will not carry us far on the road to prevention unless we can, from them, make deductions that will lead us to concrete procedures that are practicable for adoption. And such deductions are now rapidly being formulated and preventive methods based upon them are becoming available. The surprising thing is that human beings have been so slow in facing the problem directly and in attempting its solution by the method of science. Nothing is to be gained and much is to be lost by shrinking from the scientific method of approach to the problems of human thought, human feeling and human behavior.

In the long run, more is to be accomplished by eugenics than by mere betterment of the environment. I say "in the long run," for I see no immediate prospect of wide application of eugenic principles to the improvement of human stocks. Ignorance, custom, prejudice, and sentimentalism are not easily overcome, and they must be profoundly altered before we can expect eugenic considerations to play a much larger part than they do now, first, in the selection of marital partners, and, secondly, in decisions regarding the procreation of children.

Modern civilization prides itself on its compassion and its philanthropy, its prolongation of the life of the feeble, its consideration of the mentally and physically handicapped. These humanitarian efforts have gone far toward nullifying nature's method of extinguishing the unfit and of minimizing propagation by the unfit. Moreover "birth control" is at present practised more extensively by members of better human stocks than by members of inferior human stocks. Unless these two tendencies can be more than counteracted by an active promulgation of eugenic ideals, the unfit will increase and the more fit will gradually decrease in numbers.

The future of each nation depends upon those who produce the babies in that nation. As Wiggam says in his *Fruit of the Family Tree,* a recent volume, which, despite certain errors in it, I hope each one of you may read:

> Each particular baby has to be born from some particular pair of parents; and the sort of parents they are determines the sort of baby that is going to be brought into the world. The kind of human being this particular baby is going to be does not depend upon where he is born but from whom he is born. As old Sir Thomas Browne said, "Give thanks to Heaven, not that thou wert born in Athens, but that thou wert born from noble parents, and that honor, virtue and integrity lay in the same egg and came into the world with thee."

If we are to reduce the number of "nervous breakdowns" that are to occur in coming generations, if we are to have fewer mental defectives, fewer moral delinquents, fewer psychotics and psychoneurotics, we must in some way see to it that the potentialities for their development do not lie in the fertilized egg-cells from which the members of the coming generations are to start. And the best way is, in my opinion, through encouragement of research in heredity and through more thorough education of young people in the facts of heredity and the significance of those facts for human welfare rather than through premature eugenic legislation. Parents can do much to educate their children by charting family-trees of ancestors and of collateral branches with records of the good qualities and the defects of each member as far as they are ascertain-able and by drawing attention to the evil effects of notoriously bad heredity in families known to the children. Physicians and clergymen are, because of their intimate contact with families, in a position to disseminate the facts of heredity and to inculcate wholesome eugenic ideals. They may, too, be instrumental in arranging for community lectures on heredity and race hygiene, illustrated by charts and lantern slides; such lectures can be made most inspiring and enlightening.

The task of eugenics is a huge one; in its performance there is opportunity for participation by all public spirited citizens, and especially by teachers, by editors, and by enlightened business men. A local eugenics society might well be formed in every town in the country for the study of the laws of heredity, for the encouragement of the keeping of genealogic records, and for the promotion of eugenic ideals. Such a society could do much by distributing books like Wiggam's *Fruit of the Family Tree,* Conklin's *Heredity and Environment in the Development of Men*, Popenoe and Johnson's *Applied Eugenics,* and Siemens' *Race Hygiene and Heredity.* A few hours spent each year by thoughtful families upon such books and upon a periodical like the *Journal of Heredity* would, I believe, accomplish more for race improvement than any number of laws directed toward the sterilization or segregation of the unfit or toward financial reward for the propagation of the fit. Legislation doubtless will find its proper place in eugenic campaigns but that place should and must always remain subordinate to that of education regarding the significance of inborn power and excellence both for single persons and for the general welfare of mankind.

Turning now to the *control of environmental factors in the interests of nervous and mental hygiene,* I shall have to be content, in order not to try your patience, with a summary of the main directions in which such control may profitably be exerted. It goes without saying that every measure promotive of personal or of public hygiene is helpful in the prevention of nervous breakdowns in those predisposed to them. Fresh air, pure water, a sufficient and well-balanced diet, suitable clothing and shelter, avoidance of poisonings and of infectious diseases, early training to regular and wholesome habits, education in "self-control," the cultivation of varied interests, the teaching of the importance of the harmonious exercise of all the human faculties, the development of a willingness "to face reality" with equanimity, and education to a realization of the value for nervous and mental hygiene of a sense of humor, of a sense of proportion and of sound views of the world as a whole and of life—all these are environmental influences of very great importance for the maintenance of a sound mind and a healthy body.

The *prevention of injury to the germ-cells and to the developing fetus* within the womb of the mother is essential, if some of the worst enormities are to be avoided. Unfortunate is the child born of parents whose germ-cells have been severely poisoned by alcohol or invaded by the spirochaetes of syphilis. A child born of an undernourished and overworked mother has less than a fair chance. Unlucky, too, is the child whose head is brought into the world through a pelvis so narrow, or between forceps so vigorously applied, as to suffer injury to its brain. Parental hygiene and prenatal hygiene are, therefore, important parts of mental hygiene; if greater attention were paid to them, there would be fewer idiots to support and a smaller number of nervous cripples to maintain.

After the birth of the child, during *infancy* and through the *preschool age,* environmental influences may easily make or mar its nervous and mental future. Few realize the great importance of *habit training* in this early period or the detrimental influence that may follow exposure to bad example ("psychic contagion"). *Lack of a "purposeful upbringing,"* inadequacy of training of the emotions and the will, is responsible for many of the so-called "behavior problems" of children that might easily have been avoided. There are unavoidable behavior-problems, a plenty, to be solved without burdening ourselves with unnecessary tasks. Foolish parents who do nothing to curb undesirable tendencies in children, and who are overindulgent to them, yielding to their every whim and caprice, sow the wind and are all too likely to reap the whirlwind. Such parents seem to think that their children will be all right without training; they forget that even a thoroughbred collie needs to be "house broken."

Though a vast amount of research is still necessary on the psychology of the child, on the technic of habit-formation and on the relative significance of earliest conditionings, enough is already known (if the knowledge could be widely disseminated and acted upon) to prevent many of the worst mistakes. An "only child" is particularly in danger of being spoiled; when there are several children in a family, they receive, as a rule, a better training from their parents, and they do much toward training one another. Children who are nail-biters, bed-wetters, or sleep-walkers, and children who suffer from night-terrors or who exhibit day-tantrums, are predisposed to nervous and mental breakdowns and should be the objects of especial care and training from earliest childhood on. A good example on the part of each of the two parents and good teamwork by the parents are of incalculable value in child training. I am not referring to saucer-throwing, partner-beating, furniture-smashing and "cursing-one-another-out" parents; they, let us hope, are traditional rather than actual today. But I am thinking of the importance to a child of growing up in an atmosphere of healthy-mindedness, of order, of beauty, of cheerfulness, of patience, of calmness, of modesty, of temperance, of courage, of perseverance, of self-control, of sociability, of high aims, and of mutual consideration and general good will—an atmosphere in which wisdom is the guide of life. And I am deploring the exposure of plastic young souls to surroundings in which gluttony, disorder, ugliness, immodesty, laziness, moroseness, irritability, quarrelsomeness, bickering, and complaining, cowardice, ill-natured gossip, insincerity and crass selfishness prevail. Unfortunately, it is precisely in the families in which hereditary predisposition to nervous and mental disorders exists that we most often meet also with unfavorable familial environmental factors.

Neurotics and psychotics not only breed offspring predisposed to neuroses and psychoses; they are also prone to create in their neighborhood the environmental conditions that are inimical to the health of the nervous system and to the soundness of the mind. In these families, even more than in normal families, it is of importance that the children should undergo a process of *physical and psychic hardening* (of course within sensible limits). One who has not learned in childhood to bear discomforts (even pain) patiently, to tolerate when necessary the disagreeable without bitterness, to meet disappointments without repining, to go through collisions with calmness, to face danger without showing either cowardice or foolhardiness, to endure in order to accomplish, and to be loyal to what is true and just regardless of favor or disfavor, has made but a poor start in life. Some children are so badly "burdened" by a neuropahtic heredity or through postnatal disease (encephalitis) as to make their training exceptionally difficult even in the best surroundings. For them, discipline in a "habit-clinic" or in a "child-guidance clinic" with the aid of skilled psychiatrists and specialized teachers may be necessary.

In the *school period* an inability to keep pace in studies with children of the same age, or a tendency to bad conduct, should excite suspicion. A child reported as backward in his studies or as refractory to school discipline should be subjected promptly to a thorough physical and mental examination by the family physician or the school physician and also by a psychiatrist. Sometimes a physical disorder (such as a refraction error requiring glasses to give good vision, or tonsillitis and adenoids, or defective hearing, or some chronic metabolic disturbance) may be responsible, the school difficulties disappearing after this has been corrected. Sometimes a true *mental deficiency* may be discovered, requiring instruction in special classes, or even in a special school. Nothing can be worse than attempting to force a child to attainments of which he is not capable; repeated discouragement, disappointment, and failure lead to the development of an "inferiority complex" that is most harmful for later life. The children who are refractory present what is known as "behavior problems"; the refractoriness is an evidence of *character defect* that may or may not be associated with intellectual deficiency. It is this contingent in the public and private schools that requires the most careful handling if the criminal and delinquent classes are not to be recruited.

Great progress[2] is now being made in the management of these children who, unless especially aided, become distressingly at variance with their surroundings and often develop serious antisocial trends of behavior. If you are interested in learning of what can sometimes be accomplished in the training of such children read the little book entitled "*Three Problem Children*."[3] This book contains only 150 pages, but its perusal will convince you of the opportunities open to alert teachers and observant parents for the early detection of the character deviations (dependent in part at least on bad habit training) that, unchecked, lead to delinquency. I hope that this little volume will become widely distributed not only among teachers in schools but also among parents in homes, among physicians and nurses and among social welfare workers generally.

After the school period is over, *vocational guidance* becomes an important factor in the prevention of nervous and mental breakdowns. Whatever occupation is decided upon should be suited both to the intellectual powers and the personality components of the worker. In deciding upon a vocation, due consideration should be given to personal assets and liabilities. There are great numbers of persons who can succeed in occupations that do not make too great demands upon the mental and moral qualities but who will surely undergo shipwreck, if they embark upon careers for which they are, because of constitution or condition, unsuited. In instances of marked predisposition to nervous and mental disease, a certain protection and supervision should be arranged for.

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[2] Cf. the studies by B. Glueck, Esther L. Richards, Edith Spaulding, C. P. McCord, Mr. Kenworthy, Healy and Bronner, Jesse Taft, and Miriam van Waters.

[3] Sold at $1.00 per volume by the Joint Committee on Method of Preventing Delinquency, 50 E. 42d St., New York City.

During adolescence, and also in later life, a *timely solution of inner conflicts* (through the aid of the family physician, of a clergyman, of a close friend, or in severer cases, of a skilled psychiatrist) may be most helpful in preventing a mental breakdown. This is especially true of persons who show a tendency to day-dreaming, to shyness, to seclusiveness, or to suspiciousness. In such types the gaining of the confidence by a good and understanding person and a frank and free discussion of difficulties may often be soul-saving, whereas if the conflict continue too long a disastrous splitting of the personality may ensue.

The prevention of further attacks after recovery from one nervous or mental breakdown is another important field of work. Guidance through convalescence and conferences with the physician at regular intervals, even when the person has become apparently entirely well, with especial attention to the relations to the family and to the community, will go far toward ensuring permanence of nervous and mental health. It will not guarantee it in all cases, for in certain constitutions, unfortunately, nervous and mental breakdowns will occasionally occur, despite the application of every known protective measure.

A great many breakdowns, both physical and mental, could be prevented, if the growing practice of resorting to the family physician, to a consultant, or to a diagnostic group for a *health examination on the birthday anniversary* each year were to become general. Developing disturbances could then be detected in their incipiency, a preventive or curative regimen if needed could be *immediately* prescribed, and in many instances a serious illness or even a tragedy might be averted.

An adequate *organization* for the prevention of nervous and mental breakdowns in a community, in a state, or in a nation is of necessity a complex affair. It includes research institutes for the increase of knowledge of causes and remedies; neurologic and psychiatric clinics in hospitals and medical schools for the instruction of physicians, nurses, and social workers in the methods of diagnosis and treatment; habit clinics, child-guidance clinics, school clinics, community and caravan clinics for mental hygiene; cooperation of general medical practitioners, psychiatrists, teachers, clergymen, lawyers, officers of juvenile courts, legislators, and welfare workers of all sorts; and a vast campaign of education of the public at large.

The Great War gave a marked impetus to this work of prevention of nervous and mental breakdowns. The work of Pierce Bailey and his associates in the United States Army and of C. K. Clarke, C. B. Farrar and their associates in the Canadian forces greatly extended general knowledge of so-called "shell-shock" and of other nervous and mental disorders and the public as a whole has been awakened, as never before, to the significance of neuropsychiatric problems.

The National Committee for Mental Hygiene, organized a few years ago by Mr. Clifford W. Beers, who had himself suffered torture from a mental breakdown and recovered from it, has been a powerful agency in the United States for the coordination of preventive agencies and for education of the public in preventive measures. The journal *Mental Hygiene* published by the Committee already has a wide circulation and should be read everywhere.

Impacted Calculi of the Ureter. The treatment employed and the results obtained in sixty cases of impacted calculi of the ureter are presented by Alexander Hamilton Peacock, Seattle (*Journal A. M. A.*, Dec. 19, 1925). He says that while many ureteral calculi will pass through the ureter and be safely conducted to the bladder, a number of them will become impacted in the ureter. They are held in the ureter very often by such pathologic conditions as stricture, the size of the calculus, or the rough and crystal-like surface of the stone. The impacted calculi often remain in the ureter for years, and in this series of cases the average length of time was nine years. A calculus, once impacted, blocks off the urine, produces pain, pressure, dilatation of the upper ureter and renal pelvis, keeps up inflammation of the mucous membrane, and in time impairs the function of the kidney. These impacted calculi cause the patient to suffer intermittent or continuous pain for years, constantly threatening him with colic; as a result, the general health is markedly impaired. Stricture of the ureter plays a considerable role in the impaction of the calculi, being found in 18 per cent of the cases. Contrary to previous teaching, I have not found a normal constriction of the ureter except in the lower third, where the ureter travels through the bladder wall. The staphylococcus plays an important role in the formation of the stones, as it was found in 47.5 per cent of all the stone cases.

NEUROLOGIC STUDIES IN PSYCHOTIC CASES*

Dorrell G. Dickerson, M.D.
AMERICAN LAKE, WASH.
Neuropsychiatrist, U. S. Veterans' Hospital

In the past, the gap between psychiatry and neurology has been extremely wide. Psychiatrists and internists have been too prone to work independently, on the one side failing to utilize instruments of diagnostic precision and on the other showing a seeming lack of interest or rather a feeling that psychiatry was a static proposition, cause and effect being psychic and not somatic. However, at the present time there is distinct evidence that this gap is gradually closing, thanks to the work of Frankel, Hoch, Laignel-Lavastine and others in their studies on the psychiatric significance of basal ganglia disease and its relation to catatonia. They have established the fact that disordered function of the basal ganglia, either through neoplasm or infectious diseases, such as encephalitis lethargica, are capable of producing catatonic reactions in addition to the hyperkinetic phenomena.

These are important points for us to bear in mind when studying cases of so-called catatonic dementia precox. In those patients presenting catatonic reactions, where detailed anamnesis is not obtainable, every effort should be made to rule out the residuals of encephalitis lethargica or new growth of the basal ganglia. It is a well known fact that many cases of disordered function of these structures have been mistaken in the past for catatonic dementia precox. We are witnessing a union of interests in the study of these problems and the former estrangement between nervous and mental diseases is rapidly giving way to a unification of effort in the fields of internal medicine, neurology and pscychiatry.

Recent studies on the aphasias, apraxia and frontal lobe tumors no longer leave any doubt as to the genesis of psychic activities in other than cortical areas. The day is at hand when we must look at the patient as a unit, as an organism of body and mind, and strive to individualize psychiatric disorders. Our tendency in the past has been to group mental patients both diagnostically and therapeutically. In this age of dynamic medicine the individual must be managed as a unit and not as a mind detached from the body.

There are certain psychogenic as well as organic psychoses which have failed to receive adequate study. Reference is made particularly to those cases of unclassified borderline psychoses, so-called idiopathic epilepsy and senile dementia. There are also cases of a typical manic-depressive psychosis which, upon closer inspection from the laboratory and clinical viewpoint, will in many instances reveal illuminating and interesting data bearing upon their etiology. Cases are on record of so-called schizophrenia which in the final analysis, namely necropsy, have disclosed neoplasm of the frontal lobe, of the basal ganglia or an abscess in the temporal region of the cerebrum.

Convincing evidence bearing upon these assertions will be found in the studies and statistics compiled by Richard Webber. This observer found that in the last ten years forty cases of unrecognized brain tumor were sent to an insane asylum near Graz, Austria, and that among the six thousand seven hundred twenty-four necropsies which were made in the same hospital in the past forty years there were one hundred fourteen cases of brain tumor undiagnosed during life. He remarks that frontal lobe tumor is the tumor of the insane asylum.

Sanger Brown II, Robert Bing and other observers have noted the frequent association of multiple sclerosis with the psychoses, and have remarked upon the relative frequency of the role of multiple sclerosis in the etiology of mental disorders. Frequently we fail to recognize multiple sclerosis among our psychotic patients, at least in the early stages of the process. Cases will be found in which mental symptoms antedate by months or perhaps years the neurologic manifestations. More careful examinations are revealing a greater number of psychotic cases occurring in disseminated sclerosis.

It is apparent by reason of the nature of the numerous organic diseases, both degenerative and neoplastic, that careful and painstaking study should be conducted in the presence of obscure and unexplained mental disorders. We should not be too hasty in arriving at a diagnosis of idiopathic epilepsy, schizophrenia or senile dementia without first utilizing, if possible, all our diagnostic aids. By availing ourselves of the otologist, the ophthalmologist and the laboratory in our study of psychotic patients, we are checking against possible diagnostic error.

It is quite commonly known that the synotonic personality will react as a manic oftentimes in the presence of organic disease of the central nervous system; and likewise the schizophrenic personality will follow the precox cleavage under the stress of organic disease. This is particularly noticeable in those cases of most encephalitis lethargica with catatonic or stuporous reactions, and the maniacal reactions of the epileptic with or without demonstrated brain disease.

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* Read before King County Medical Society, Seattle, Wash., Dec. 7, 1925.

A diagnosis of senile dementia or cerebral arteriosclerosis is an extremely easy one to make, given the age and the proper physical and mental symptoms, yet we find that upon close study many of these cases fail to reveal the expected lesions on autopsy. This is well borne out by the article of L. B. Alford in the *Journal of Nervous and Mental Diseases* for August, 1917, in which he finds cases of leptomeningitis, posterior spinal degeneration and tumor; in very few of the cases examined did he find the characteristic lesions of senile dementia.

The value of the centriculogram in the study of obscure cases of psychiatric disorders with organic findings cannot be disputed. In the case presented this procedure clinched the diagnosis of cord disorder and served as a localizing agent. It was also used in the cases presenting convulsive seizures, and served to rule out or to localize organic brain disease.

Many times we are led far afield in examining our psychotic patients by the distorted somatic complaints and the misinterpretation on our part of the complaints and findings. Occasionally somatic delusions will be found to rest upon a definite organic basis. We should, therefore, exert every effort to eliminate the possibility of organic disease in the psychotic patient. A complaint of headache in a patient presenting mental disease should always be investigated by both funduscopic and radiographic examinations; a search for organic disease in these patients should be undertaken in all of its details.

Realizing the necessity for brevity in the cases presented, only those elements of interest from a symptomologic and clinical aspect are given. It is hoped that these cases will illustrate in a measure the body of this article.

Case 1. Age. 27. Ex-marine. Mother of nervous temperament. Rheumatism at ten. Chorea at fifteen. History of frequent head colds and sinus trouble in service.

In early part of 1918 developed dull feeling in head, pains in back of skull, especially noticeable after exertion, general weakness, slight periods of nausea and stomach trouble associated with headaches and pains in lower abdomen. During past two years has had rheumatism in arms and legs; "shooting pains" in extremities and down the inner side of both arms. Past year has seen double, described as a shadow along the left border of every object. Deafness left ear. Has developed a fear and dread, cannot describe, accompanied by sleepy feeling. Gradual development of weakness in both hands, beginning three or four years ago, more marked in right. Complains of numbness in right index finger and thumb and between first and second fingers; feels that fingers are asleep. Occasional numbness in upper lip. Complains of stiffness and weakness in both legs, greater in right. Right fore-arm feels weak and tingles, and headaches increase during attack. Has headache of six years duration, and general weakness of six hours duration, involving both upper and both lower extremities. Tingling and numbness of right index finger and thumb of one year duration. "Shooting pains" in arms and legs for past two years.

History of diagnosis of encephalitis in a Canadian hospital, not confirmed. At that time his temperature ran from 96.2° to 97.5° and the pulse was 52-58.

Neurologic: Facies apathetic, somewhat mask-like. Fine tremor of closed eyelids. Swaying on either foot with eyes closed. Bilateral enlargement of thyroid lobes. Marked hyperemia over upper part of chest and thyroid gland. Bilateral Clipple-Weil, greater on right. Right triceps absent, left triceps and biceps slightly hyperactive. Patellars hyperactive, equal. Hyperalgesia to pin prick over right half of body, more marked in upper right extremity and upper part of trunk. Narrow band of hyperalgesia along inner border of each upper extremity from axilla to hand inclusive. Left abdominal absent, right upper and lower fatigable. Umbilical reflex absent. Right plantar absent, left hyperactive with contraction of the quadriceps extensor group and inversion of left foot. Evanescent left Hoffman. Sluggish right cremasteric. Right grip weak (right handed). Right thenar and hypothenar eminences atrophic. From third dorsal spine cephalicly there is some diminution of vibration sense. Moderate atrophy of right deltoid and sternomastoid.

Bilateral diminution of corneal sensibility, both reflexes present. Pharyngeal anesthesia. Gag reflex absent. Right nasolabial fold shallow. Pupils slightly irregular, left greater than right; sluggish reaction to light. Consensual reflex bilaterally diminished. Pupils are markedly contracted in the dark to about 2 mm. Instillation of cocaine, 2 per cent solution, causes unequal dilatation of pupils, right greater than left. Zone of light reaction limited. Pronounced hyperidrosis of upper part of body, more especially in axillary regions. Marked dermographia over chest and back. Marked passive hyperemia over neck anteriorly and posteriorly, more pronounced posteriorly. After injection of air into spinal canal all deep reflexes and pathologic reflexes markedly exaggerated. Blood pressure 110-70, both sides. Pulse 72 sitting, 65 reclining.

X-ray reports: Stereo of head, May 21, 1924: "Flattening of occipital bone, with an increase in thickness about 4 mm. Sella turcica region shows an increase in density extending well into sphenoidal sinus. Frontal region narrow and compressed in appearance, formation probably congenital.

X-ray of head, March 30, 1925: Accessory sinuses clear and open. Frontal sinus appears small. No definite pathology noted.

X-ray of cervical spine, September 15, 1925: Rather long prominent spinous processes shown.

X-ray of head and cervical spine (ventriculogram), September 28, 1925: Head, no air shown in ventricles of brain. Cervical spine, air extending from first dorsal to first cervical.

Basal metabolic reports: Plus 27.55, after one month plus 11.33, one year later 6.3.

Spinal fluid, September 30, 1925; pressure increased (not measured by manometer); clear, water white; globulin, Nonne phase I, Ross-Jones, Noguchi negative; sugar positive; cells 2; Wassermann negative in all dilutions; colloidal gold 0000000000. Blood Wassermann negative. Urinalysis; extremely faint trace of albumin. Blood count: R. B. C. 5,150,000;

hemoglobin 90; W. B. C. 6,900; polys 57; small lymphocytes 31; large lymphocytes 6; eosinophiles 2; myleocytes 1; transitionals 3.

Special eye examination: Right and left vision 1.0; however, he can see with plus 1.00 in each eye just as well. Eye grounds easily seen, no abnormality; discs and vessels normal.

Diagnosis (tentative): Extradural tumor of the cervical cord.

Case 2. Ex-soldier. Age 33. Farm laborer. One brother suffers from wasting disease of muscles. Influenza and tonsillitis in service; convalescence from influenza delayed. Easily fatigued and slow in regaining health after influenza. First noticed a general weakness early in winter of 1920; tired easily after little exertion, especially noticeable in right hand. Noticed a weakness of right grip.

Neurologic: Tendency to sway to right when walking with eyes closed. Fine tremor of extended fingers. Coarse tremor of face, lips and protruded tongue. Fine tremor of closed eyelids. Patellars markedly exaggerated, right greater than left. Tendo achilles exaggerated, right greater than left. All deep reflexes of upper extremities are definitely exaggerated, greater on right. Right cremasteric sluggish. Plantar responses on right are brisk, left diminished. Clipple-Weil reflex present on right and left, more marked on right. Tongue deviates to right. Right nasolabial fold obliterated, left shallow. Palpebral fissures are unequal in width, right greater than left. Myokymia in isolated muscle groups, especially noticeable in right supra- and infraspinatus, biceps, triceps and deltoids, and all muscles or right shoulder girdle. Twitchings are precipitated by tapping with finger or hammer. Right grip definitely weaker than left (right handed). Right wrist measures 6¼ inches, left 6½ inches, right forearm middle third measures 10 inches, left forearm middle third 10½ inches. Muscle tone on right side diminished in upper and lower extremities, more marked in upper extremity. Atrophy of small muscles of both hands, greater on right side. Interosseous muscles of both hands are atrophied, more marked on right side. Atrophy of thenar and hypothenar eminences, more marked on right. Speech ataxic and at times almost inarticulate, especially when speaking rapidly.

Electric reactions: All muscles respond well to normal amount of microfarads, except right triceps which took more and showed signs of muscle fatigue. Right supraspinatus responded well. Right infraspinatus responded after stimulating motor points several times, but reactions very sluggish.

Blood Wassermann negative. Urinalysis: trace of albumin. Eye examination: eye grounds negative. X-ray of skull: very small sella turcica, clinoids fusing on left side.

During latter part of September, 1925, patient swallowed a mixture of lysol and tincture of iodine, with supposedly suicidal intent, due to depression and anxiety. States that he was despondent at that time.

Diagnosis: Amyotrophic lateral sclerosis.

Remarks: Diagnosis made by staff and confirmed by Dr. George W. Swift. It is interesting to note that patient has been considered as suffering from neurasthenia, habit spasm and pulmonary tuberculosis over a period of four years. Apparently the process has been of gradual development and slowly progressive in nature.

Case 3. Age 33. Ex-soldier. Fireman by occupation. Sister died of pulmonary tuberculosis. Father died of heart trouble. Discharged from service on S. C. D. epilepsy. History states that seizures began three months after herniotomy while in service. States that seizures are becoming more numerous and more severe.

Laboratory: X-ray of skull following injection of air into the canal shows normal butterfly shadows. Spinal fluid pressure 20 mm. (Hg.), sitting; appearance, (blood) clear (except first part); water white (except first part); globulin, Nonne phase I, Ross-Jones, Noguchi negative; sugar positive; cells 2 (34 red cells); Wassermann negative in all dilutions; colloidal gold 00000000000. Blood Wassermann negative. Routine blood: W. B. C. 11,250; poly neutrophiles 78; small lymphocytes 21; large lymphocytes 1.

Detail of convulsion: Gets a warning of impending seizure; is nervous; has a nervous feeling in the stomach, usually about half an hour before seizure. Pain in top of head some time before attack. Has been heard to cry out before seizure. Occasionally bites tongue. Occasionally suffers urinary incontinence. Has noticed during last year or two a twitching in muscles of right side of face just before attack; this has been present several days before seizures on some occasions and is always on right side of face. Occasional twitching of muscles on right side of shoulder and right arm before seizure. Has had urinary bladder disturbance for some time, more marked in past six months; has difficulty in starting the flow.

Neurologic: Slight swaying in Romberg posture, more noticeable in backward direction. Slight tendency to overshoot the right upper extremity in F. N. test. Left patellar greater than right. Left tendoachilles greater than right. Right plantar absent, left diminished. Evanescent right Babinski and Hoffman. Abdominal and umbilical absent. Right cremasteric absent, left sluggish. Right corneal absent, left sluggish. Pharyngeal absent. Right palpebral fissure wider than left. Right side of face, upper and lower, paretic. Right nasolabial fold shallow. Coarse occasional tremor of right side of face, more marked upper half. Coarse tremor of tongue and lips. Transient Clipple-Weil right. Right grip weaker than left (right handed). Right thenar eminence slightly atrophic. Skin of right hand shiny, soft in texture. Some congestion of veins on funduscopic examination. Slight blurring of the margins; this is especially noted after severe seizure. Speech tremulous and tendency to slur.

Mental: Memory impaired for recent and remote events. Shows deterioration in all fields. Becomes irritable, abusive and threatening several days before seizures occur.

Notes: On September 12, 1925, 15 c.c. of spinal fluid was removed and replaced by 15 c.c. of air.

Observation of convulsive seizures: September 17, 1925, 2 p. m. Awake at onset. Warning cry. Did not fall. Face cyanosed and red. Eyes open at first, rolled back. Clonic stage, two minutes duration. Convulsion began in both arms and finally involved all extremities. Fell and cut gash over right eye.

September 17, 1925, 10 a. m. Onset while awake. Warning cry. Did not fall. Face deeply cyanosed. Eyes open, pupils reacted to light. No tonic stage, but clonic stage lasting four minutes. Convulsion began in arms and did not involve any other part of body. Did not bite tongue. No incontinence.

September 17, 7 a. m. Awake at onset. No cry. Fell, no injuries. Deeply cyanosed. Eyes closed. Tonic and clonic stages; tonic stage of four minutes duration, clonic stage six minutes. No particular part of body involved at onset, all four extremities involved later. No incontinence. No biting of tongue.

September 6, 1925, 6 a. m. Asleep at onset. No cry. No fall. Cyanosed. Seizure of ten minutes duration. Frothed at mouth. Incontinence of urinary bladder.

On two other occasions seizures were violent in character and patient was practically in a status epilepticus. This may last from twenty-four to forty-eight hours.

Diagnosis: Multiple sclerosis with convulsive seizures.

Case 4. Age 32. Laborer. Ex-soldier. History uneventful until four years ago when he began to have convulsions. First attack occurred while working in lumber camp in Oregon. Began to have occasional slight headaches in right side of head. Had no warning. Sometimes bit his tongue during convulsions. No incontinence. Has complained of deafness in right ear since 1919, with constant buzzing in right ear. Attacks have occurred infrequently since date of onset. Can give no description of seizures.

Neurologic: Right patellar and right tendo achilles greater than left, both brisk. Fine tremor of fingers. Fine tremor of closed eyelids. Left cremasteric sluggish. Abdominals not elicted. Left plantar defensive; spreading reflex prominent. Left Gordon. Swaying in Romberg. Nerve deafness right eighth. Right upper face paretic. Corneal sensibility diminished bilaterally.

Laboratory: Urinalysis; extremely faint trace of albumin. Blood Wassermann negative. Spinal fluid negative. Routine blood; W. B. C. 11,550; polys 76; small lymphocytes 17.

X-ray of head; no defect of bony landmarks. Ventriculegram made September 25, 1925; 15 c.c. of spinal fluid withdrawn and replaced by 15 c.c. of air. X-ray shows defect in contour of left ventricle upper part in A. P. view. Normal butterfly shadow of right ventricle.

Description of seizure: While undergoing examination the patient had a convulsion. He was reclining on examining table. No warning cry heard. Left leg was abducted slowly and rotated upwards and inwards to the vertical plane. Left forearm was flexed on arm and drawn upwards and inwards. The head was slowly turned from the middle line to extreme left. Facial muscles distorted and pulled to left. There was a short tonic and clonic period, and occasional convulsive movements of right upper extremity were noted. The head was continually pulled to the extreme left. Pupils were dilated and eyeballs rotated to the left. No incontinence of bladder or rectum. The usual cyanosis of the face was observed. There was frothing at the mouth and stertorous breathing. Seizure lasted about two minutes. There was a quick recovery, very little confusion, no disorientation, no lacerations of tongue, due to prompt insertion of tongue depressors. No headache was complained of following attack. Inasmuch as back of examiner was turned when the cry was heard, it is felt that the initial movement was not detected and it is possible that the seizure had begun before it could be observed.

Mental: Deteriorated emotionally and intellectually. Memory defective for recent and remote events. Shows absolute amnesis for period of seizure. Has idea that he has been framed by relatives on account of some money he had which they wanted possession of. Protests that he was thrown into jail by his relatives.

Examination, made March, 1920, by Dr. House of Portland, Ore., shows that an attack was observed in his office. Right side of face became smooth and blank, mouth was drawn up a little to left. This was very distinct and well marked. Another examination showed the following; "This leaves no doubt in my mind that the disorder is petit mal of Jacksonian type and that he has somewhere in the left side of the brain an adhesion or other slight organic change. I am confident that the trouble is not due to syphilis." Another report made by the same physician, dated February 1924, states: "Gives a history of convulsions occurring for the past two or three years. Had one while in my office which was distinctly Jacksonian in type. It was my opinion that the trouble was Jacksonian epilepsy."

Staff diagnosis: Convulsive seizures, epileptic in character, cause undetermined.

Remarks: In view of the positive findings neurologically, the absence of any evidence of syphilis of the central nervous system, the abnormal shadow of the left ventricle, the observations of Dr. House and the observations made in this hospital, the existence of intracranial pathology involving the left pre-Rolandic area, probably in the region of the face and arm centers, is suspected.

Case 5. Age 31. Occupation, farmer. Ex-sailor. Sister died of some nervous trouble, aged 32 years. Reached eighth grade at 18. Operation for tumor mass left breast in 1917. Had mumps and tonsillitis in service. Mother began to notice some mental disturbance in July 1924. Observed lapses of memory, poor judgment, unmotivated acts. Diagnosis of multiple sclerosis with psychosis was made in June, 1925. No complaint.

Neurologic: Swaying in Romberg, tendency to fall to the right. Incoordination of upper and lower extremities in finger to nose and heel to shin tests. Stands and walks with wide base and has a tendency to walk to the right. Gait is clumsy and slightly staggering in character. Carries head tilted slightly to right. Left hand grip weaker than right (left handed). Hypertonicity of muscles of upper and lower extremities. Hands cold and acrocyanotic, left distinctly more so than right. Deep reflexes greatly exaggerated, right greater than left. Left Babinski, Gordon and Hoffman. Right, Clipple-Weil. Facies somewhat flattened on right. Right nasolabial fold shallow. Right palpebral fissure wider than left. Left internal strabismus. Coarse nystagmus, more marked to the left. Movements of upper extremities exaggerated with tendency to past pointing in finger to nose test. Abdominals markedly exaggerated, left greater. Slight patellar and ankle clonus on left.

Incontinence of urinary bladder. Fine tremor of closed eyelids. Eye grounds show slight elevation of the papilla of the left; vessels somewhat enlarged and slightly tortuous. Irregular dark area about the circumference of left papilla. Caloric tests negative.

Laboratory: Blood Wasserman negative. Spinal fluid entirely negative. Ventriculogram: lateral ventricles appear dilated. Special eye examination states: "Vision in left eye is deficient." Pulse has ranged from 70 to 90; temperature from 36° to 37°; respiration varied from 18 to 20.

Mental: Disoriented. Restless. Cannot cooperate in any examination. Confused. Memory impaired. Deteriorated emotionally, volitionally and intellectually. Definite blocking at times during examination.

Diagnosis: Diffuse lesion, in region of fourth ventricle.

While none of the diagnoses have been confirmed by operation, it is hoped that surgical interference can be obtained after proper authorization in those cases which will be especially selected. In some cases, where deterioration and dilapidation have been so marked, it is felt that nothing can be gained by neurosurgical interference.

TOTAL AND SUBTOTAL RESTORATION OF THE NOSE. To be acceptable, a surgically reconstructed nose, says Vilray P. Blair, St. Louis (*Journal A. M. A.*, Dec. 19, 1925), must be covered with smooth skin, have a normal contour, have an epithelial lining, and provide an adequate airway. Though not always necessary, a rigid support of bone or cartilage will usually add to the quality of the result. It is very desirable that the size and form of the new nose be in harmony with the particular face. Nasal reconstruction amounts to sculpturing with the live tissues for material, and this must be done in conformity with good surgical usage, combined with mechanical accuracy and some artistic feeling. Blair describes his method of procedure.

NEUROLOGIC CONDITIONS OF THE HEAD

THEIR EARLY DIAGNOSIS*

Ernest Sachs, M.D.
ST. LOUIS, MO.
Professor of Clinical Neurologic Surgery
Washington University School of Medicine

One of the important factors in the successful outcome of any surgical procedure is the early recognition of the disease. Of no conditions can this be more truthfully said than of intracranial conditions, particularly brain tumors. Our diagnostic efforts in the past twenty years have all been directed along these lines. Though we still see cases of brain tumor that are far advanced, it is gratifying to note how communities that have had their attention drawn to this subject have changed in comparatively few years. When I started this work in St. Louis fifteen years ago, I rarely saw a tumor case that was not blind or so far advanced that at most only palliative measures could be instituted. Today we not infrequently see cases of suspected brain tumor whom we have to observe for a time in order to make a diagnosis. This has necessitated greater and greater refinement in the study of our cases. We are obliged to employ methods today that formerly were not necessary.

I propose today to discuss the more important methods and shall point out what in my experience have been the more valuable guides to an accurate diagnosis. The history of these cases is of tremendous importance but the ordinary medical history does not develop many of the valuable points that enable one to make a diagnosis. A special neurologic history should be taken which is planned particularly with this end in view. The first and most important point in such a record is a chronologic account of the symptoms and signs. As a rule the first symptoms are an indication of where in the brain the lesion has started. Of course it is possible that a lesion has begun in a silent area but even then the first symptom indicates which portion of the brain, whose function we know, is becoming involved. A few examples may indicate more clearly what I mean.

A man was working in the field when he suddenly fell over with a convulsion beginning in his right hand and spreading to the face and leg of the right side. Following this he had weakness of the right hand. On admission he had a double choked disc, headache, and increased pathologic reflexes on his right side. He evidently had an intracranial lesion in his left cerebral cortex and the information just cited would have led to a diagnosis of a lesion in his left motor area.

On going into his history with still greater care and trying to find out the earliest symptoms, we discovered that for many years he had had subjective auditory disturbances. He would hear sounds that nobody else heard. The sounds were always described as church bells. These sounds were experienced by the patient more frequently for several weeks prior to this convulsion. This one symptom was of vital significance and, instead of operating on him over his motor area, we operated on him over the posterior portion of his temporal lobe, and there found a localized tuberculous focus of the dura which pressed on the cortex. It was readily removed and the patient made an uneventful recovery.

Another patient, a young married woman, had what appeared to be a general epilepsy. She had no general signs of pressure, she had slight pathologic reflxes on her right side. X-ray of her skull showed a large calcified process in her frontal region. In spite of repeated plates taken from every direction, it was impossible to determine on which side of the longitudinal sinus the process lay. I was inclined to think it was a slow growing tumor, an endothelioma. Upon shaving her head, a small scar was discovered over her left frontal region. Going into her history again, the parents then recalled that as a child she had struck her head and had a lacerated wound. This made it more probable that we were dealing with an old traumatic lesion. At operation, under this scar, we found a depressed fracture with extensive degeneration and calcification of the left frontal lobe. A resection of a large portion o fthe left frontal lobe was carried out which seems to have cleared up the patient's symptoms.

The first case illustrates a type of symptom that I consider of great value in these cases, namely, subjective sensation. There may be sensations referable to the various special senses, smell, taste, vision, hearing, or that very peculiar type known as the "dreamy state." Each one of these subjective sensations has its origin in a different portion of the cerebral cortex and consequently is of great localizing value. I am frequently asked this question: How can this patient have a brain tumor, when none of the cardinal signs and symptoms of increased intracranial pressure are present? The patient has no headache, does not vomit, and sees perfectly. Whereas these symptoms do occur in the typical or well advanced case of brain tumor, they are often absent in the early stages and even in advanced cases in children. Certain types of glioma or tumors that do not interfere with the cerebrospinal circulation frequently do not have these symptoms, so that we must depend for our diagnosis on focal signs.

Every thorough neurologic examination must include a careful taking of the eye fields. This, in my experience, not infrequently establishes a focal diagnosis that otherwise could not have been possible. An homonymous contraction of the fields means definitely a lesion behind the chiasm and, with other symptoms the patient presents, it usually is possible to determine where in the visual pathway, between the chiasm and the occipital lobe, the lesion is located. An accurate knowledge of the external and internal topography of the brain is, of course, essential so that one is able to visualize the various centers while working out a diagnosis. For example, homonymous hemianopsia may be produced by a lesion in the temporal or occipital lobes. As a rule a partial homonoymous defect is more characteristic of a temporal lobe lesion, while a complete homonymous blindness is more characteristic of an occipital lesion. If, however, a facial paralysis of the central type is present, it almost certainly indicates a lesion of the temporal lobe, since that center is the one in the motor cortex that lies closest to the temporal lobe. If, on the other hand, a patient has a sensory disturbance in addition to his hemianopsia, or that striking type of sensory disturbance known as astereognosis, then the hemianopsia arises from the occipital lobe.

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This sounds fairly simple, but I need hardly point out to any one of wide clinical experience that the analysis of such cases is often difficult and rests on proper evaluation of the symptoms, which is really nothing other than clinical judgment. Some years ago, when Dandy first published his method of air injection, for which he claimed such astounding things, and some experienced older clinicians were completely swept off their feet, he also stated that only fifty per cent of brain tumors could be localized by the usual neurologic methods. My colleague, Dr. Schwab, and I reviewed fifty consecutive cases of brain tumor and found that we had made a correct localizing diagnosis in 75-80 per cent of the cases. This large percentage of correct localizations we believed was due to the meticulous care with which the cases had been examined, and these figures are not a bit better, if as good, as the results obtained in first class neurologic clinics, such as Philadelphia, Boston, and the National Hospital in London.

We have several other valuable diagnostic aids which may be of great value. The Barany ear tests were more generally used five years ago than today. By irrigating the ears with hot or cold water, by turning patients and having them point when blind-folded, a series of symptoms are developed that may be useful in locating a cerebellar lesion. As a rule, however, the general neurologic examination brings out all these points and with much less discomfort to the patient. Occasionally one sees a case that shows abnormal neuro-otologic signs when all else is normal, but this is extremely rare. Other valuable aids are stereoscopic x-ray plates and x-ray pictures with air in the ventricles, Dandy's pneumoventriculography. A small percentage, 8-10 per cent of brain tumors, can be diagnosed from the x-ray plate alone, due to the tumor throwing a shadow; a much larger number show definite changes in the skull that are due to increased pressure, so-called convolutional atrophy, and deformities of the dorsum sellæ, and in young people separation of the sutures. These latter changes, however, are of very little localizing value; they merely indicate increased intracranial pressure which almost always means tumor. It has been my experience that with the great improvement in x-ray technic we must be very cautious as to what we call convolutional atrophy. With the Buckie diaphragm the skulls of children and young adults show some of these markings, especially in the frontal region. I use x-ray findings as an aid to the regular examination. When positive, they are of help, but a negative x-ray is of no significance. It is possible to have a cerebral or cerebellar tumor without any abnormality being noted in the x-ray.

There are a certain number of cases that we diagnose as tumor, in which it is impossible by any of the methods thus far mentioned to make a localizing diagnosis. Brain tumors can only be cured if they can be removed, and therefore it behooves us to use every means at our disposal to arrive at such a diagnosis. Dandy's method of ventriculography may be used in such cases. It sometimes yields wonderful results but I have found its field of usefulness limited and, furthermore, it is a method attended by real danger and has a mortality of about 8 per cent. This figure is based on 392 cases of air injection collected by Dr. Francis C. Grant from the various neurosurgical clinics in the country. A diagnostic method that has such a mortality must be used with great caution, and after using it for several years I have learned to apply it only in carefully selected cases.

Another group of cases that present themselves to the neurologic surgeon are the epilepsies. It is hardly necessary to emphasize that the vast majority of general epilepsies cannot be helped by any surgical measures; however, all general epilepsies ought to be considered from that point of view. As a rule, most men can determine quite readily that such a case presents no surgical problem, but occasionally a careful neurologic examination, which should be done as a matter of routine, develops some point that should make one suspicious. The following case is an instance of this.

A healthy girl had occasional attacks of epilepsy; the convulsions were general, accompanied by unconsciousness. In the history, however, this point was elicited, that many of her attacks were preceded by a peculiar sense of unreality. She would be conscious, yet seemed in a dazed condition, would not know where she was. Her neurologic physical examination showed no abnormality. Her eye grounds were normal, her x-ray showed no pressure changes, but her eye fields showed a very definite partial homonymous hemianopsia. On this one symptom I felt justified in recommending an exploration and at operation we found a huge cyst of the temporal lobe. Its removal stopped her attacks and she has since married and is raising a family.

Another patient had been visiting various clinics for fifteen years for what was diagnosed as general epilepsy. Her physical examination was negative, so were her eye grounds. Some weeks before admission she began to complain of headaches. Examination again was negative but an x-ray plate, which was now taken, showed a huge partially calcified tumor. At operation a huge endothelioma was readily removed. She is practically well now, at least vastly improved. She used to have numerous daily convulsions; she now has about two a year.

This fact must be kept in mind in all epilepsies, that, if the convulsions are present for a long time, even if the cause is removed, patients may continue to have some convulsions. If a patient has a focal or Jacksonian epilepsy, he should always have the benefit of an exploration, in spite of the fact that in some of these cases no benefit may result, but exploration in such cases is such a safe procedure (we have never lost one in this class of case), that I have no hesitation in recommending it.

Traumatic epilepsies, those that follow a year or more after a head injury, are also surgical problems, and where there is a focal character to the convulsion, exploration should be done. Operation is safe in the hands of neurologic surgeons or any men trained to do this type of surgery, but permanent cures are much rarer.

Every surgeon inevitably sees many traumatic cases and the treatment of head injuries is a big chapter that could well be treated in a separate paper. My time only permits me to touch on this subject briefly.

Middle meningeal hemorrhages and depressed fractures, even though they have no symptoms, should be operated on at once. On this there is no disagreement. The cases that are unconscious or semiconscious with no focal symptoms offer the most difficult problems. I believe that the edema which accompanies a contusion and laceration of the brain is the principal cause of these patients' symptoms. Our efforts must be directed to combat this edema. This may be done in one of three ways: removing fluid from the brain by administering hypertonic salt, 33 per cent, intravenously, or giving $MgSO_4$ per rectum; decompression to give the brain room to expand during the period of edema; and, thirdly, lumbar puncture. This latter procedure I am opposed to, as I have seen sudden deaths from the withdrawal of but a small amount of fluid, due to the cerebellum dropping on the medulla and causing respiratory failure. I, therefore, employ the first two methods, usually the hypertonic fluids, occasionally decompression.

An entirely different group of cases are those characterized by pain in the face, trigeminal neuralgias and allied conditions.

Up to ten years ago, when patients with spasmodic pains in the face were all thought to have trigeminal neuralgia, our chief concern was how safely to give these patients permanent relief. Today our problem has assumed a very different aspect. We know how to cure true trigeminal neuralgia, but we have come to realize that there are many patients who complain of pain in the face who have not a true trigeminal neuralgia or tic douloureux. How these are to be differentiated becomes our gravest problem. Can we positively recognize a true tic douloureux? There are a number of points that are diagnostic.

In the first place the history. True trigeminal neuralgia is characterized by a sudden very intense shooting or burning pain in the distribution of one or more branches of the fifth nerve. In the vast majority of cases the pain begins in the second or third division and but rarely begins in the first or supraorbital division. The pain is lightning-like in character and often is said to be gone almost instantly. There may be numerous recurring paroxysms but each one comes and goes very rapidly. The pain may be set off by the lightest touch in some area of the face and such points are spoken of as "trigger points." These "trigger points" are, however, not always present. The pain is always confined to the area of distribution of the fifth nerve and never crosses the median line. There is never any sensory disturbance to be made out, nor is there ever any paralysis of the motor branch of the fifth nerve which supplies the muscles of mastication. The severity of the pain can well be estimated by the patient's unwillingness to open or use his mouth. I have seen cases that started an attack every time they opened their mouths to drink water and rather than do this they were absolutely dessicated and in several instances had gone days without a drop of water. Others were emaciated and starved because the swallowing of food caused such intense pains. Still others refused to shave or wash that side of the face as it would precipitate an attack. One poor woman had allowed the entire side of her face to be burnt with an actual cautery in the hope of getting relief. Patients that present the picture just described have a major trigeminal neuralgia and the diagnosis is readily made, but when the disease begins in one branch, the suffering is not so great, though the same diagnostic points hold true; no change in sensation or motor paralysis, pain confined to the area of the nerve involved and the paroxysmal character.

There is a group of cases that have pain in the face that are now quite generally being called Sluder or sphenopalatine neuralgias. Apparently these pains are in some way connected with the sphenopalatine ganglion for, when the ganglion is cocanized or destroyed by alcohol injection according to the Sluder technic, relief occurs. I have had an unusual opportunity of seeing a great many of these cases with Dr. Sluder. They are at times very difficult to distinguish from a tic douloureux and the procedure we have found useful is to have Dr. Sluder anesthetize the sphenopalatine ganglion through the nose and see if this gives temporary relief. If it does, the case is treated as a Sluder neuralgia. In other cases we inject one of the divisions of the fifth nerve and if we get relief in this way, then we classify the case as one of true trigeminal neuralgia and treat it either with alcohol injection or by the more radical method of extracting the root of the Gasserian ganglion.

Though I don't want to go into a discussion of the operative side of this condition, it seems wise to point out that the operative treatment is now so well standardized that if the diagnosis is correct we can promise the patient permanent relief. If the operation is done with care there is no reason to have any mortality. We have done 71 operations on the Gasserian ganglion without a death, the oldest patient being 89 years old. Nevertheless, it is a serious operation and, I have no hesitation in saying, one that should not be undertaken by the general surgeon.

There are two possible complications that occasionally develop and, when they do occur, they cause the surgeon much worry. As a result of the extraction of the posterior root the cornea becomes anesthetic and an ulcer may develop which may be very difficult to heal. The other complication is that very occasionally a facial paralysis develops but I believe this complication, which occurred in our series three times, we have eliminated by a change in technic. In spite of these possible complications, there is no operation today that I know of that by and large gives greater satisfaction to the patient and surgeon than the radical operation for trigeminal neuralgia.

THE SYNDROME OF COMPRESSION OF THE SPINAL CORD*

Henry W. Woltman, M.D.
ROCHESTER, MINN.
Section on Neurology, Mayo Clinic

About thirty-seven years ago, a certain captain of the British Army made the rounds of the physicians of the Kingdom, because of pain in his back. His manner was so persistent and his complaints were so singular that he was eventually crowned a neurasthenic, and even thought to be insane. At the end of the third year of his pursuit, fortune led him to consult those two eminent physicians, Sir William Gowers and Sir Victor Horsley. Gowers made a clinical diagnosis of tumor of the spinal cord, and Horsley removed the tumor, the first of the kind ever removed. One year later the patient was well.

In considering compression of the spinal cord, we do not include the condition due to such violent disturbances as fracture of the spine or gunshot injury, but rather that due to the gradually increasing loss of sensation and motility below a given level, which results from a progressive compression of the cord or cauda. This distinction is important, because in the former surgical interference offers little, whereas in the latter such interference is usually indicated at the earliest possible moment to prevent irreparable injury to the cord.

ANATOMIC AND PHYSIOLOGIC CONSIDERATIONS

Any spark of interest in neurology a medical student may have is usually quickly and completely extinguished by throwing to him the bare and disjointed bones of neuroanatomy and neurophysiology, on which to wear down his eye-teeth. It is with some misgiving, therefore, that I am about to stir up this old and painful complex. For most clinical purposes, however, an elementary knowledge of these subjects will suffice.

The ancient Chinese, whose medicine dates from the reign of Hoam-ti, 2687 B.C., believed that the spinal cord ended in the testicles and that its function was to conduct semen. A truly remarkable degree of knowledge of the anatomy and physiology of the cord was current as early as 167 A.D. Galen knew that the cord could be cut lengthwise without producing paralysis; that section of one side of the cord would result in paralysis below that point on the same side of the body; that cutting the cord at progressively higher levels would cause correspond-

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ingly higher paralysis, and that section between the third and fourth cervical segments would abolish respiration entirely and thus cause death. Galen supposed that the brain had something to do with intellect, but he was a cautious as well as a wise physician, for he remarked, parenthetically, that an ass has brains.

PHYSIOLOGIC CONSIDERATIONS

Knowledge of the function of the nervous system grew very slowly. This was partly due to the fact that the early investigators selected the most difficult of all organs to study, the cerebellum. Was not the cerebellum the seat of the soul? And was not the soul the most important thing to investigate? Furthermore, animals had no souls.

The presence of the central gray and of the peripheral white matter of the cord invited speculation. Bellinghiere thought that the gray matter conducted sensory impulses, and the white matter, motor impulses; that the anterior fibers brought about flexion of the trunk, the posterior fibers extension, and the lateral tracts, movements toward the corresponding sides.

It was not until 1811 that the modest and profound investigator, Sir Charles Bell, found that he could cut across the posterior roots without convulsing the muscles of the back, but that on touching the anterior roots with the point of a knife, the muscles of the back were immediately convulsed. He demonstrated for the first time that the anterior roots were motor in function.

Galen claimed the discovery of the posterior root ganglions. "Nature," he said, "has done an admirable thing of which all anatomists to this time were ignorant." Lancisi believed that these ganglions contained muscle and served as little hearts to hurry along the nerve fluids.

Since the spinal nerves carry both sensory and motor impulses, a lesion of both anterior and posterior roots will manifest itself by a disturbance of all forms of sensation and motility. Involvement of the posterior root alone results in a disturbance of all forms of sensation; after entry of the posterior root into the cord, however, the various forms of sensation pursue different paths; therefore, a lesion within the cord might not affect all forms of sensation. Involvement of the anterior root alone produces only a motor disturbance.

The fibers which carry sensations of pain and temperature are closely associated, and may be regarded as taking the same course. They cross almost immediately to the opposite side of the cord in the anterior commissure and ascend to the brain in the lateral spinothalamic tracts. A lesion of the tract results in loss of pain and temperature sensibilities below the given level, on the opposite side. Postural and vibratory sensations ascend in the posterior column on the same side, and do not decussate until they have reached the brain stem.

Tactile stimuli take two pathways: one runs up the posterior column on the same side of the cord, but crosses to the opposite side after reaching the brain stem; the other crosses almost immediately and ascends in the anterior spinothalamic tract of the opposite side. Therefore, a lesion of either side of the cord alone will not abolish tactile sensation completely. There is a difference, however, in the two forms of tactile sensation. The one which ascends in the opposite anterior spinothalamic tract does not discriminate, whereas that which ascends in the homolateral posterior column does. By discrimination I mean that, if a line is traced anywhere on the skin, a person can, under normal conditions, tell what direction this line is taking, or if a number is drawn on the skin, he can recognize it. Furthermore, he can localize the point touched with considerable accuracy; he can tell how often the stimulus was applied, and whether he was touched simultaneously with one or with two points, providing they were not too close together. The last is the so-called compass test of Weber. Although tactile discrimination on the same side below a lesion which involves the homolateral posterior column is lost, yet the patient is aware that he has been touched by virtue of the intact anterior spinothalamic tract on the opposite side.

We do not even yet know just where or in what manner motor impulses arise. Let us assume, for the time being, that they leave the pyramidal cells of the pre-Rolandic area, whence they pass downward in the pyramidal tract, 90 per cent of which crosses to the opposite side about 1 cm. below the pons and takes its place in the lateral column of the cord. The pyramidal decussation was not known as such until 1710, when the great French physiologist, Francois Pourfour du Petit, described it, and established for all time the doctrine of contralateral innervation.

A lesion of the pyramidal tract results in the form of paralysis seen in ordinary hemiplegia. The upper extremity usually assumes a state of partial flexion, presumably because man has inherited a prehensile function from his ancestors; the lower is usually extended because of innate resistance to gravity. The paralyzed muscles are not wasted; they are hypertonic; the tendon reflexes are more active than normal, and the plantar response by the Babinski method is usually extensor, that is, on stroking the sole of the foot, the great toe turns up.

The motor impulses leave the pyramidal tract and are relayed to the cells of the anterior horn or lower motor neurone on the same side, the axon of which leaves the cord through the anterior root. A lesion of the lower motor neurone results in a form of paralysis that differs in many respects from that caused by involvement of the upper motor neurone. The paralysis resembles that in poliomyelitis. The muscle fibers supplied by the corresponding neurones are weak and atrophied, and the tendon reflexes are reduced to a point commensurate with the amount of muscle substance remaining.

THE BROWN-SEQUARD SYNDROME

As in compression of the spinal cord one side is usually affected a little before the other, the sign manual of this type of disturbance is an approach to the Brown-Séquard syndrome. The cardinal features of this syndrome are: (1) homolateral paralysis below the given level, due to involvement of the pyramidal tract; (2) impairment of pain and temperature sensibilities of the opposite side below the level in question; and (3) preservation of tactile sensibility on both sides.

SEGMENTAL OR LONGITUDINAL DIAGNOSIS

In order to determine very accurately the level of a lesion one must pay close attention to the distribution of the sensory, motor and reflex disturbances.

The segmental distribution of cutaneous sensation is very orderly. If one pictures a man as walking on all fours and maps out on him the various fields of sensation supplied by the different segments of the cord, he would appear very much like a zebra with the stripes succeeding each other from in front backward, running in long bands down the arms, in circles around the trunk, in bands down the legs, and ending in concentric rings around the anus. Actually these segments overlap each other like shingles on a house, so that two or three adjacent roots must be destroyed before an area of anesthesia can be demonstrated. A point of great importance is the fact that in man, after the third month of intrauterine life, the cord grows more slowly than the vertebral column. At birth the lower end of the cord lies opposite the third lumbar vertebral body; by the time maturity is reached, it has moved upward to the lower end of the first lumbar vertebra. The root of a given segment, however, runs downward in the canal and emerges from the spine at the corresponding vertebra.

A simple rule, known as Kocher's rule, may be applied, if the anesthesia due to a cord lesion is so intense that the level across the back can be ascertained. The spine is divided into equal thirds; if the level of anesthesia runs through the upper third, one counts upward three spinous processes to the site of the cord lesion; if the level runs through the middle third, one counts upward five processes, and if through the lower third, seven processes.

The rule of segmental innervation also applies to the muscles. At this point the memory must be refreshed from textbook tables of anatomy so that one can tell in what segment of the cord the cells of the anterior horn lie and supply a given paralyzed muscle.

REFLEXES

The reflexes aid greatly in establishing the level of a lesion. Tendon reflexes are among the simplest in their mechanism, since they involve only an afferent limb, a sinapse in the cord, and an efferent limb. The specific stimulus for a tendon reflex is evidently the lengthening of the particular muscle or group of muscles concerned. Hoffman has shown that increasing the length of the muscle by 1.11 per cent is sufficient to elicit a reflex contraction. When the refractory period is so much shortened that reflexes follow each other with great rapidity, a clonus results. The total latency of the knee jerk is about 0.0055 second, which includes 0.002 second for the synapse. An intact arc is necessary. If a lesion exists anywhere in the arc passing through the second to the fourth lumbar segments of the cord, for instance, the knee jerk which passes through these segments will be abolished. Since the pyramidal tract carries inhibitory fibers also, any lesion would result in an increase of any tendon reflexes below this level. Thus, a cord lesion which abolishes the knee jerk may result in an increase of the tendo achillis reflex, which passes through the first sacral segment, but tendon reflexes passing through higher levels of the cord would not be altered.

The abdominal reflexes are somewhat more complicated. They require not only an intact spinal arc, but also an intact cerebrospinal arc. This is why the tendon reflexes are increased in hemiplegia, whereas the abdominal reflexes are usually decreased on the paralyzed side. The Babinski reflex is the

TABLE I

CHARACTERISTIC FEATURES OF ROOT PAINS , TYPICAL WHEN THERE IS PRESSURE FROM SPINAL CORD TUMORS, COMPARED WITH THOSE OF SCIATICA*

	Root Pain	*Common to Both*	*Sciatica*
Situation	Anywhere. Referred to peripheral distribution of neurone. At first unilateral, later bilaterial (girdle) and symmetric.	May be same	Buttock, posterior aspect of thigh, calf. Rarely bilaterial.
Character	No tenderness.	Usually dull ache	Tenderness at nodal points.
Onset	Gradual		Often acute, especially after strain, exposure or "cold."
Course	Continuous or recurrent. Spreading to continguous territory, especially opposite side, and growing in intensity.	Reappearing at intervals. Worse on coughing, sneezing, straining.	First attack often the worst. Field of activity unchanged.
Flexion of Head	Aggravates pain		No change
Kernig and Laseque		Present, especially if tumor is low.	
Spine	Often fixed	Listing common	
Temperamental Idiosyncrasies	Patient without pain on retiring awakened later (at 3:00 a. m.) by pain; relieved by kneeling or exercise. Returns to bed toward morning. Often prefers to sleep sitting in chair.		Often kept awake by pain on retiring. Pain wears off gradually, allowing patient to sleep. Worse on exercise, and on sitting in chair.
Influence of Weather and Temperature	None		Often striking. Cold aggravates; Heat relieves.
Neurologic Findings	Sensory, motor, reflex and spinal fluid		None. Tendo achillis reflex often absent in severe cases.

*Behavior of pain from lower cord and caudal neoplasms exemplary as compared to that of sciatica, with which confusion is common.

most valuable single sign of involvement of the pyramidal tract. The lightest stimulus that will give a response should be used; otherwise, a false positive reflex might be obtained. To obtain the reflex, the thumb-nail or a pointed instrument is carried forward from the heel along the lateral border of the sole, thence directed mesiad across the balls of the toes. When the stimulus is carried forward under the external malleolus, which is known as Chaddock's method, the great toe may turn up also. A flexion of the small toes following percussion on the balls of the toes, the Rossolimo reflex, or on the dorsum of the foot, the Mendel-Bechterew reflex, also indicates a lesion of the pyramidal tract. The corresponding reflex in the upper extremity is the Hoffman reflex. To obtain it, the patient's hand is relaxed with the wrist slightly extended; the distal phalanx of the third or second digit is then rather sharply flexed and suddenly released by allowing the patient's nail to glide from its held position which snaps the phalanx into extension. If there is a lesion of the pyramidal tract, the distal phalanx of the thumb will flex on release of the finger. The sign is not as reliable as the Babinski reflex.

Reflexes may be of extraordinary complexity, as for example, the postural and labrynthine reflexes. If one starts a metronome at 100 beats a minute every time he feeds a dog, salivation will finally be induced by the sound of the metronome alone, provided it beats 100 times a minute, but not if it beats ninety times a minute. Reflexes of this type are referred to as conditioned. In 1912, Yerkes showed that an earthworm, which had been trained to take a particular course, did not lose its "memory" when the cerebral ganglions were removed. The tail went along its prescribed course unerringly. This would seem to indicate that some persons might get along better in society without brains than they do with them. Even the complicated movements of daily life become more and more automatic or reflex with practice. Thus, the number of neurones involved is reduced and economy results. For example, a beginner will play tennis with his entire brain and cord, but the expert uses little more than his tectospinal tract. A school of psychologists, the behaviorists, believe that practically all psychic phenomena can be brought under the head of reflexes.

Aside from various crossed and paradoxic reflexes, an alteration in the quality of the reflex itself is occasionally seen. A good example of this is the peculiar reflex behavior of patients with myxedema. The duration of the reflex time, particularly relaxa-

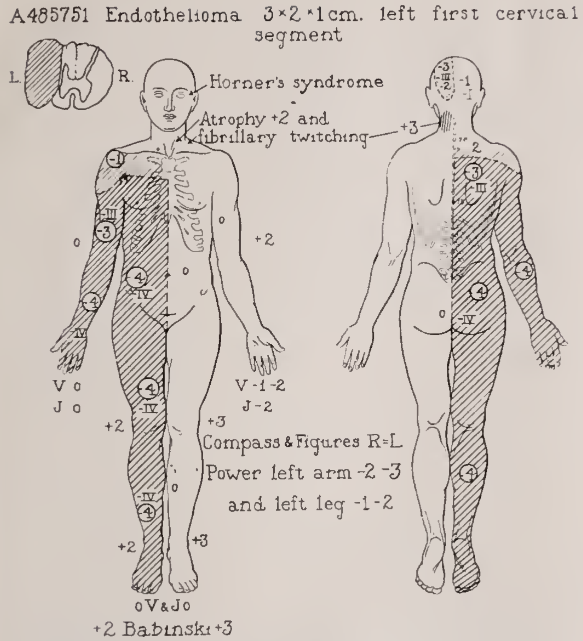
A485751 Endothelioma 3×2×1cm. left first cervical segment
L.
R.
Horner's syndrome
Atrophy +2 and fibrillary twitching
+3
+2
V o
J o
V -1 -2
J -2
+3
Compass & Figures R=L
Power left arm -2 -3 and left leg -1 -2
+2
+3
oV&Jo
+2 Babinski +3

Fig. 1. Epithelioma opposite the first and second cervical segments.

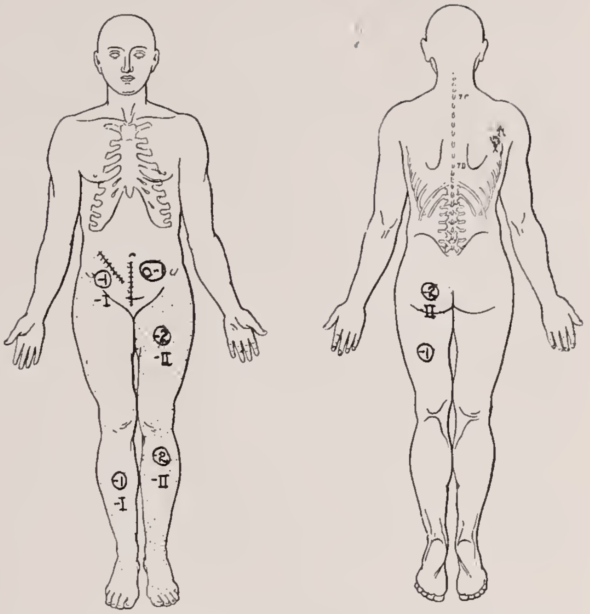

Fig. 2. Spinal cord tumor with root pains leading to multiple operations.

tion, is greatly lengthened.[4] The sign possesses considerable diagnostic value and disappears on the administration of thyroxin, when the basal rate is elevated. It is not seen in cases of hypopituitaryism, although the basal rate may be equally low. It is not known at what points this slowing takes place.

ROOT PAINS

The signal forerunner of spinal cord compression is a root pain. Root pains have certain distinctive characteristics (table I).

The classic picture of cord compression is found in cases of tumor. Tumors may arise within the cord, often without pain, or they may arise outside the cord, either within or outside the dura. The following points in a case are illustrative (fig. 1):

Over the right half of the body there was loss of pain and temperature sensation as indicated by the hatching, but tactile sensibility was normal throughout; the left arm and leg were paralyzed and spastic, with increased tendon and positive Hoffmann and Babinski reflexes. In other words, the Brown-Sequard syndrome, due to a lesion on the left side, was well developed. However, the upper sensory level, corresponding to about the fourth cervical segment, was not sufficiently sharp to permit an accurate localization. The drooping eyelid and small pupil on the left, known as Horner's syndrome, were due to a sympathetic paralysis, and indicated a lesion not lower than the first or second dorsal segments. The left sternomastoid, trapezius, and nuchal muscles were weak, atrophied, and fibrillating, which indicated involvement of a lower motor neurone. Since these muscles are all innervated by cells of the first four cervical segments on the same side, a sharper localization became possible. Over the left occiput was a patch where pain, temperature, and tactile sensations were lost. Clearly all of the first and second posterior root fibres were damaged. These findings localized the lesion very sharply to the left side, in the region of the first and second cervical segments. The projectile vomiting was probably caused by encroachment on the foramen magnum, and since the history indicated a progressive involvement, tumor was the most likely ultimate cause. Removal of the endothelioma (fig. 1) was followed by marked improvement.

In making an examination an accurate history is of the greatest importance. In the following case the only objective findings were a positive Kernig and an increase of globulin in the spinal fluid. The diagnosis of tumor was made largely on the basis of the history.

Case 1. Caudal tumor masquerading as sciatica for ten years: hypertrophic arthritis. A man, aged fifty-two, had had a dull pain in the left sacroiliac region, thigh, knee and calf for ten years. The pain was worse at night and was relieved by exercise, so that the patient often preferred to work at night. There was no relation to changes in weather. Five years before he had had his teeth extracted and tonsillectomy performed without relief. Three years before, the pain extended to the right side of the back and down the right leg, and was so severe that he could not lace his shoes. It had disappeared for two years, following the administration of laudanum and salicylates by rectum, and changing the style of shoes, but returned with increased severity thirteen months before examination, and morphin was resorted to daily. He never missed work.

The Lasegue sign and Nonne test were positive. Hypertrophic arthritis of the lower dorsal spine was diagnosed by roentgen rays. A neurofibroma was removed from the level of the second lumbar vertebra, and complete recovery followed.

In the following case the spinal fluid findings gave additional support to the diagnosis of cord compression.

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*The figures on the charts indicate a disturbance on the basis of 0 to 4, 0 meaning normal, and + and — various degrees of increase and decrease, respectively. Roman numerals indicate temperature disturbance, Arabic numerals, touch, and circled numerals, pain.

Case 2. Spinal cord tumor with root pain leading to multiple operations. A woman, aged twenty, complained chiefly of pain in the right lumbar and abdominal areas (fig. 2). One and one-half years before examination a dull ache appeared to the right of the second lumbar spine, radiating laterally to the lower costal margin. Almost every night the pain was so intense that the patient had to sleep in a chair. Fourteen months previously the appendix and part of the right ovary were removed without relief; eight months before, the pain had radiated to the right knee and a cast was applied to the leg for several weeks. Four months before, the remaining portion of the right ovary was excised without benefit.

The right patellar and tendo achillis reflexes were slightly more active than the left; a positive Babinski reflex was present on the right, a doubtful one was noted on the left. Vibration and joint sensibility were slightly impaired over the right lower extremity. There was slight urinary urgency. The spinal fluid was straw colored; the Nonne test was positive; the fluid did not fluctuate on jugular pressure. An extramedullary cord tumor was removed from the anterior aspect of the seventh thoracic segment.

THE SPINAL FLUID

Yellow spinal fluid may be found in cases of jaundice, from the admixture of old blood with spinal fluid, in cases of brain tumor that encroach on the ventricles, and in cases of block of the spinal cord, when it is known as Froin's loculation syndrome. The yellow fluid is usually found below the block, but may also tint the fluid above. Block of the canal was also evidenced by failure of the spinal fluid to rise in the manometer tube attached to the lumbar puncture needle on light compression of the jugular veins. This valuable sign was first described by Queckenstedt.

The routine use of the spinal fluid manometer has convinced me that the method of estimating spinal fluid pressure by noting the rate of flow from the needle so often leads to error that it is of little or no value.

Sicard and Forestier first made use of a preparation of iodin in poppy seed oil, known as lipiodol, which is opaque to the roentgen rays. This may be introduced into the spinal canal through a cistern puncture, and since it is heavier than spinal fluid, will sink to the point of obstruction, where it may be located by means of the roentgen ray. Lipiodol is irritating, however, and should not be used unless necessary. Filling the canal with air preliminary to roentgenographic examination may also aid in localizing a tumor.[16]

TUMORS OF THE UPPER END OF THE SPINAL CANAL

Tumors of the upper and lower ends of the cord may present certain peculiar features. The crossing of the pyramidal tracts at the anterior aspect of the cord, in an exposed situation, may result in a quadriplegia unaccompanied by any sensory disturbance. The sensory disturbances associated with high cervical tumors may be limited to the lower extremities or they may fluctuate from time to time and from place to place, probably because the canal is relatively large here and permits shifting of the pressure. Involvement of the descending root of the fifth nerve may result in pain referred to the face, and in anesthesia for pain and temperature over certain districts of the face, since these fibers are probably concerned with the conduction of those forms of sensibility. The proximity of the foramen magnum may bring about signs of brain tumor, such as projectile vomiting and choked disc.[14]

TUMORS OF THE LOWER END OF THE SPINAL CANAL

At the lower end of the cord, other difficulties may be encountered. The relative shortening of the cord incident to growth, and the emergence of the roots through the anterior foramina of the sacrum often make it extremely difficult to determine whether there is a tumor of the cord, of the cauda, or of the pelvis. The objective findings may be the same. The lumbar puncture needle may give some idea of the location of the tumor.[10] Failure to obtain fluid with a needle usually means that the needle has entered the tumor. Pelvic tumors are sometimes revealed by roentgen ray examination but are demonstrated with greater certainty by rectal examination, a procedure which should never be neglected, since exploration of the spine for a tumor hidden in the pelvis is obviously a serious blunder.

THE ROENTGEN RAY AS AN AID IN LOCATING TUMORS

The roentgen ray is not often helpful in localizing a spinal cord tumor. Occasionally dumb-bell shaped tumors are seen, which lie partly within the canal and partly outside of the spine, the communication between the two masses being narrow. These tumors often produce erosion in the lamina which shows in the roentgenogram. One of the strange manifestations of these tumors is a sudden and transitory collapse of the lower extremities, which often causes the patient to drop suddenly to the ground.[13]

KERPOLA'S SIGN OF EXTRAMEDULLARY TUMORS

It is usually difficult to determine before operation whether a tumor is intramedullary or extramedullary. The numerous signs of differentiation which have been described are fallible. Kerpola was first to call attention to a valuable differential point; an area of relatively intact sensation in the perianal region is often found in extramedullary tumors, as opposed to intramedullary tumors.

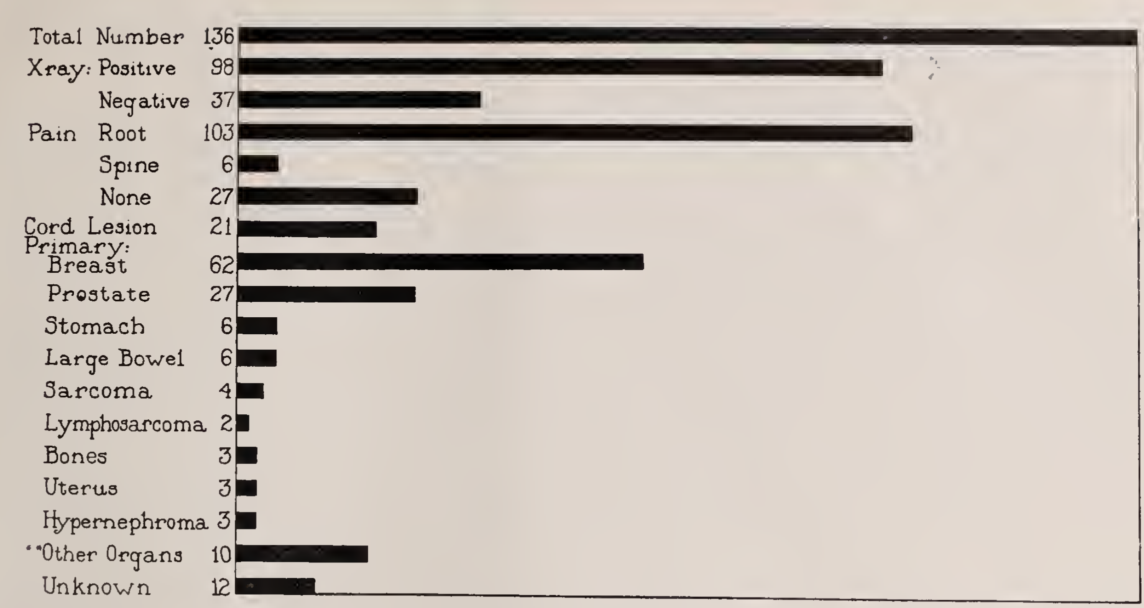

Fig. 3. Metastasis of malignant tumors to the spine. The primary growth may have been removed eight or more years before, as in the breast. Carcinoma of the prostate metastases most frequently to the lower part of spine and pelvis; carcinoma of the breast and gastro-intestinal tract seems to involve any level of the spine indifferently. The spinal cord involvement may be complete within two days; often the paralysis is progressive for two or three months; ten or more months may be required before the paralysis is complete.

* * Includes palate, nasopharynx, skin, parotid (mixed tumor), thyroid, melanocarcinoma of skin, sarcoma of chest wall (three cases), myeloma, lungs (primary), testis, labia.

METASTASIS OF MALIGNANT TUMORS

Metastasis of malignant tumors to the central nervous system is a derilect encountered in our diagnostic lanes. It may arise from some recess so hidden as the nasopharynx. Fortunately, the roentgenogram usually gives a warning. The symptoms may be the same as those of any benign cord tumor, except that the progress of malignant growths is usually more rapid. The primary site in our series is indicated in figure 3. Carcinomas of the breast and prostate head the list. It must not be forgotten that a primary carcinoma of the breast may have been removed many years before metastasis became evident. Since carcinoma of the prostate does not necessarily produce local symptoms, a rectal examination should be made as a routine.[3]

DIFFERENTIAL DIAGNOSIS

Hypertrophic pachymeningitis is among the various conditions encountered which may be difficult to distinguish from tumor. In this disease, the dura becomes thickened, usually in the cervical region; it pinches off the nerve roots, causing pain, atrophy and sensory disturbances of the arms, and it compresses the cord, causing impairment in function below.

Meningomyelitis may remain localized. There is often a history of antecedent trauma or infection. As a rule, the examination does not disclose a Brown-Séquard syndrome; the upper level of anesthesia is usually indistinct, and all qualities of sensation are equally involved, probably because the inflammation penetrates the cord. A cystic or adhesive arachnoiditis may be encountered on exploration, which is sometimes followed by improvement.

The spine itself may be the seat of the original disturbance. Compression of the cord from Pott's disease is not uncommon. A somewhat infrequent cause of compression is a chornic hypertrophic osteoarthritis of the spine, which the roentgenogram often fails to show. A series of these interesting cases has been reported by Parker and Adson.

Spondylolisthesis, or a slipping forward, usually of the fifth lumbar vertebra on the sacrum, often results in injury to the cauda. The first case of its kind was reported by Lane. The patient was a nurse, who had cared for an insane patient. This man often imagined that he was playing cricket, and would strike his nurse a blow across the back.[2]

Occasionally a case of Paget's disease is encountered in which the cord shows evidence of compression.

Spina bifida may be confusing and may even be associated with a superimposed tumor. The difficulty lies in the fact that the symptoms of spina bifida may be progressive and late in appearing, presumably on account of traction on the cord and nerve roots which are anchored below. Spindle-legs, deformity of the feet, an area of sacral hypertrichosis, and a sacral dimple are signs of warning. The roentgen ray may not reveal a spina bifida occulta, since the developmental defect may be limited entirely to the cord.[18]

In subacute combined degeneration of the cord the lesion, although progressive, is usually painless and diffuse. A toxic process as, for instance, that associated with pernicious anemia, is respnosible.[17] Often multiple neuritis is associated.[6]

The diagnosis of tabes is sometimes made in cases of tumor of the cord or cauda, probably because the patellar reflexes are absent, but a complete examination usually reveals the true nature of the disease, for syphillis of the nervous system is diffuse.

Syringomyelia is sometimes hard to distinguish from an intramedullary tumor. The characteristic waistcoat type of sensory disturbance, showing a predilection for the pain and temperature fibers, since these lie near the central canal; the local atrophy caused by extension of the process here and there into the anterior horns, and the tell-tale scoliosis, frequently associated, usually help in making a correct diagnosis. The history is often very long. One of our patients was a woman who, twenty years before, drove through a prairie fire. In the bottom of the buggy lay some straw which caught fire. She was highly amused at the frantic efforts made by her companion to pull her feet out of the burning straw, whereas she could leave hers reposing in the flames with perfect comfort. When a tumor is associated with a syringomyelia the diagnostic difficulties may be insurmountable.

While the multiple sclerosis may produce a transverse cord lesion, the youth of the patient, the absence of pain, and the presence of cerebral signs, such as tremor, scanning speech, nystagmus, optic atrophy, ocular palsies, and the tragic euphoria, usually put us on our guard.

CONCLUSIONS

1. When a patient presents a stubborn pain for which there is no obvious explanation, he may have root pain.

2. When a patient presents a gradually increasing loss of motion and sensation below a given level, a cord tumor may be the cause.

3. Fifty-seven per cent of tumors found are removable; 42 per cent of patients are completely cured and working; 25 per cent more are improved. About two-thirds of these patients are greatly benefited by operation. Without operation, the disability would of course become worse.

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EPIDEMIC ENCEPHALITIS*

R. M. Bowell, M.D.
BONNERS FERRY, IDA.

In 1917 Von Economo drew attention to a disease then appearing in Austria, characterized by drowziness and ocular palsies. In 1918 Netter described similar cases in Paris and Harris and Hall reported cases from London. Since that time the disease has been reported from various parts of the world. In England it was at first believed to be a form of food poisoning, due to the bacillus botulinus but investigation eliminated food as the source of the disease and proved that we were dealing with an epidemic type of encephalitis.

An important etiologic consideration is the question of the relationship between poliomyelitis and encephalitis. Many observers believe them to be the same disease, differing only in the site of localization in the central nervous system. There are many points of similarity between them; both are infectious in origin and the pathology is similar. In seasonal prevalence there would seem to be a slight difference between the two. During epidemics poliomyelitis tends to be a disease of summer and autumn, while encephalitis during 1917-18 occurred most often in the early months of the year. Sporadic cases of both diseases, however, may occur at any time or season.

Poliomyelitis is more a disease of early life, 80 per cent of cases occurring under twenty years of age. We have observed encephalitis between the age limits of 2½ and 64 years. There would also seem to be some connection between encephalitis and influenza, the two great epidemics occurring at the same time. However, the two diseases were seldom seen in the same household at the same time and the organisms found in connection with influenza were not found in encephalitis. Following the epidemic of influenza of 1889-90, cases of encephalitis were reported in Germany, and Oppenheim in 1907 described an influenzal type of encephalitis which resembles our epidemic type very closely. In fact, cases have been reported in Europe in connection with influenza for the past 450 years. Until the specific etiologic factor has been isolated and definitely determined, the actual relationship of encephalitis to poliomyelitis and influenza must remain in doubt.

Most observers have reported an ultra virus in encephalitis, which resists drying or glycerine for a long time. It has been shown that it will live in milk and water. Results of animal inoculation have varied considerably. Some observers have succeeded in producing the disease in monkeys by inoculation of an emulsion of brain substance. It has also been transmitted to rabbits by intracerebral inoculation or inoculation into the cornea, in the latter instance the virus traveling through the vitreous and by way of the optic nerve to the brain. Inoculations have also been successful, using saliva, cerebrospinal fluid and nasopharyngeal secretion. The virus has been demonstrated in apparently healthy individuals and we evidently have the problem of carriers in connection with encephalitis as with other infectious diseases. The virus was rarely demonstrated in the blood. It persists in the individual for a long time, cases being recorded where ocular symptoms developed and other members of the family were affected after three years time.

In this connection the work of Rosenow should not be forgotten. It is possible that various organisms may cause encephalitis under certain conditions, and the disease may be due to certain strains of some of our more common organisms having neurotropic properties. Rosenow reports a precipitation reaction in connection with poliomyelitis and states that a large percentage of cases of encephalitis give the same reaction. A very plausible explanation would seem to be that both diseases are due to a streptococcus having neurotropic properties.

In the first case which I observed, a very fulminant and fatal case, cultures of the spinal fluid and blood showed a pure culture of the same organism described by Nuzum and others in connection with poliomyelitis. Autopsy confirmed the diagnosis of encephalitis and the same organism was again cultured from the heart's blood and ventricular fluid. In the last fatal case observed, a man of 64, who had suffered from parkinsonism for five years, the onset dated from the removal of infected teeth and tonsils. Here, indeed, is a possible portal of entry for microorganisms and most likely some of our more common ones which elected to localize in the brain. Overwork and loss of sleep would seem to predispose to the disease.

The pathology is constant and characteristic. The brain shows vascular congestion, as do the meninges. There is toxic degeneration of the nerve cells, small round cell infiltration, especially about the blood vessels, and proliferation of the glial tissue. The parts most frequently affected are the midbrain, basal ganglia, pons and medulla, the region of Dieter's nucleus in the cerebellum and to a lesser extent the cord.

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*Read before Bonner County Medical Society, Sandpoint, Ida., Oct. 21, 1925.

The symptoms of encephalitis may be considered under the headings of the onset or acute stage and the subsequent or chronic stage. However, in the chronic forms the history of an initial acute febrille stage may be very vague, the symptoms usually suggesting mild influenza. In typical cases there is a sudden onset with fever and malaise, the temperature varying from a fraction of a degree up to 103°. There is usually a complaint of headache, this being a prominent symptom in the more severe cases. If in addition there are palsies of the muscles of one or both eyes, resulting in squint or double vision, and lethargy, the picture is quite typical.

The double vision seldom persists long, often but a few hours, and may be entirely absent. In the last fatal case observed it was noted on the last day only. The lethargy is rarely deep, the patients being easily aroused, but relapsing into sleep again as soon as left undisturbed. The more acute cases are often less lethargic than milder ones. Delirium is common and is usually occupational in character. There may be constant mutterings during sleep, thought is confused, and answers to questions are often irrelevant remarks. In the cases that progress favorably towards recovery or pass into the chronic stage, the fever subsides, delirium ceases and they become normal again, usually after a long convalescence, or present some of the residual nervous symptoms noted below. Symptoms referable to the vascular system, gastrointestinal tract or kidney are notoriously lacking.

The symptoms of the chronic stage, commonly stated to be sequellæ of encephalitis, are more properly considered as the evidence of the continuance of a chronic infection in the central nervous system, much as in the case of a syphilitic infection. The general clinical picture of chronic epidemic encephalitis is that of a progressive nervous disease, frequently phasic in its development, the individual symptoms indicating by their nature and character the disseminated localization of the morbid process in the central nervous system, with a pronounced predilection for certain areas, particularly the extrapyramidal system. One of its chief characteristics is a symptomatologic polymorphism and a variability in respect to the grouping and mode of development of symptoms, which is by no means inferior to the clinical picture of nervous disease due to syphilis or to that of disseminated sclerosis.

The symptoms of chronic encephalitis may be classified as neurologic, vegetative and psychic. Under the neurologic group will be mentioned parkinsonism myoclonias, choreas, torsion spasms and dystonias, ocular disturbances and disturbances of sleep and respiration.

Parkinsonism first attracted attention because of its frequency and its characteristic clinical aspect which often strikingly suggests the classical paralysis agitans. It is the form of chronic encephalitis which most frequently emerges directly from the initial febrile stage. However, it may not make its appearance until several years after the onset. Its main characteristic is the dystonic extrapyramidal syndrome, that is, steadily increasing muscular hypertonia and rigidity. The rigidity may be localized or general, more often the latter. The face assumes a mask-like attitude and the entire body is stiffened. Spontaneous movements are slow and markedly limited, and automatic movements cease. The gait is slow and there may be an antero- or retropulsion.

These patients are very uncomfortable because of the muscular rigidity, especially when reclining, and their rest is therefore much disturbed. The difficulty of passing from static to dynamic muscular function sometimes leads to catatonic rigidity and in young individuals the diagnosis of dementia precox may be erroneously made. The tremor is often absent and the tremor while at rest, which is noted in paralysis agitans, is of less frequent occurrence in encephalitis. In encephalitis active movement increases the tremor, while in paralysis agitans it is diminished by effort. Muscular rigidity results in difficulty in mastication, deglution and in speaking. These patients talk slowly, using few words and short phrases because of the muscular effort involved and for this reason they often appear to be dull mentally, when they are not so affected. The course is usually progressive, although a few mild cases clear up. The longer the interval between the initial stage and the onset of parkinsonism, the poorer the prognosis.

Under the heading of extrapyramidal hyperkinesia may be grouped tremors, myoclonias, choreiform movements, athetoid and torsion-like movements and torsion spasms. Tremors may be general or localized and the rhythm, amplitude and unformity vary from one patient to another. The tremors are usually noted on voluntary muscular action.

Myoclonias manifest themselves as muscular jerks, brusque, more or less rapid up to lightning-like twitches of muscles or muscle groups. They may occur in short spells of three or four or periodically in more persistent series of thirty or forty twitches a minute. Localized myoclonias are the rule.

Choreiform movements may be localized or general, the latter resembling Sydenham's chorea very closely, particularly when occurring in children. From these more massive jerking movements all grades of transition to athetoid and torsion-like movements occur. The latter are usually observed in the extremities.

Involvement of cranial nerves is frequently found, the ocular nerves being most often affected. These lesions result in various isolated palsies of the eye muscles or impairment of the associated movements of the eyes. There may be paralysis of accommodation and an Argyll-Robertson pupil may be observed in the absence of syphilis. Optic neuritis is rare. The bulbar cranial nerves may be affected with atrophy of temporal or masseter muscles, hemiatrophy of the tongue, difficulty of mastication and deglutition. Disturbances of cardiac rhythm with tachycardia or bradycardia have been reported.

Sleep disturbances are common, particularly insomnia, which may be almost complete, or constantly interrupted sleep, due to myoclonic unrest or in parkinsonism to muscular rigidity. Again, the patient may be awakened by terrifying dreams. The hours of sleep may be reversed, with sleep during the day and wakefulness and roaming about at night.

Respiratory disorders are interesting, the most common being disturbances of rhythm, polypnea, bradypnea or apnea. Polypnea is of most frequent occurrence, usually coming on in attacks, often at a more or less definite hour and lasting from a few minutes to an hour or perhaps for the entire night. Both respiratory phases are accelerated but the breathing is shallow. Bradypnea is rare and in its most extreme form develops into apnea. Spasmodic coughing may be the sole sequel of encephalitis, a dry reiterated cough or becoming violent and ending in vomiting. Respiratory tics manifest themselves, as hawking, snuffing and spitting, or hissing and puffing through nose or mouth, the latter forms occurring most often in children. Epidemic hiccough is now believed to be a sequel of a mild, usually unrecognizable encephalitis.

Cortical hyperkinetic phenomena in the form of epileptiform convulsions, either of the generalized or Jacksonian types, are rare. Symptoms of an endocrinal or vegetative origin are frequent. Oily seborrhea, giving the so-called greasy face, is commonly observed in parkinsonism. There may be fits of perspiration. Hypersecretion of saliva, as well as immobility of the oropharynx, is responsible for drooling. Polyuria has been observed not infrequently with polydipsia, when it cannot be distinguished from diabetes insipidus. Metabolic disturbances, particularly a tendency to obesity, are frequently reported. In late parkinsonism pronounced emaciation is the rule.

Lastly we come to the psychotic and general nervous symptoms. True, sharply defined psychotic phases, such as confusion, delirium, agitation, etc., belong to the acute febrile stage. In adults many atypical psychoses may prove to be sequellæ of encephalitis. Some of the symptoms of bradyphrenia may be due to primary motor disturbances, an inhibition without true mental defects. In parkinsonism we must not be deceived in the character of the apathy, emotional stupor and lack of initiative, as it is motor and not psychic. In adults we sometimes find emotional disturbances, such as hypochondriasis with obsessions or impulsions and depression which may develop to a high degree. The depression differs from the depressive element of manic depressive psychosis in the absence of true inhibition and flight of ideas.

In children and young adults changes of character and morals are the characteristic psychic changes. They usually set in some time after the initial stage and manifest themselves by restlessness, erratic attention, irritability, queer manners, emotional irritability with uncontrollable outbursts of anger, cruelty to animals or children, abusive language, truancy, dishonesty and theft. There may be a precocious erotism. Because of lack of concentration and unreliable faculty of perception and retention of ideas they are backward in school. Psychotic disturbances in children may be nocturnal only, with almost perfectly normal conduct during the day. Such coarse moral deterioration is rarely seen in adults.

A prominent symptom in all cases is a sensation of fatigue and asthenia, manifesting itself by a decreased rate of working, a feeling of incapacity and indifference toward work and by rapid exhaustion. This phenomenon may be of endocrinal origin, as it reminds one of the asthenia of Addison's disease.

Typical cases seen in the acute febrile stage offer no difficulty in diagnosis, the fever, delirium, confusion, lethargy and ocular palsies being characteristic. Mild cases, especially the ones with little temperature, are often confusing. A history of double vision of even brief duration is of importance. Mild cases should not be overlooked, if possible, for a chronic stage, even when following after an interval of some time, may present disabling symptoms of a grave character. It is probable that we are overlooking some mild cases having influenzal symptoms and followed by a long convalescence with lack of energy and easily induced fatigue.

The spinal fluid in the initial stage may be entirely normal or show slight pleocytosis and a slight globulin test. In many cases the sugar content is increased. This point may be of value in differentiating it from tuberculous meningitis.

The symptoms of the chronic stage are more or less characteristic and the general clinical aspects of the case will in most cases decide the differential diagnosis. Conditions that may occasion confusion with and require differentiation from encephalitis in the chronic stage include disseminated sclerosis, syphilis of the central nervous system, paralysis agitans, Wilson's disease or hepatolenticular degeneration, Sydenham's or Huntington's chorea and botulism. Cases with psychotic residuals may be difficult to distinguish from various types of insanity.

The prognosis of encephalitis is always grave and the outcome of an individual case ever in doubt. The death rate in epidemics is as high as 40 per cent. In a small series of cases under my observation death occurred in 30 per cent. Complete recovery may follow the acute stage but one must be guarded in his statements in this regard, as symptoms of the chronic stage may occur later. Von Economo considers that two-thirds of the cases surviving the acute stage pass into the chronic stage. During the chronic stage recovery is rarely noted.

The treatment of both the acute and chronic stages has been notoriously unsuccessful, as is attested by a multitude of remedies suggested, among which may be mentioned sodium iodide or hexamethylenenamine intravenously, typhoid vaccine and sodium cacodylate. Hyoscine is recommended in parkinsonism. As yet no immune sera have been produced.

Urinary Calculi. The chemical composition and structure of urinary calculi in relation to radiography is discussed by Daniel E. Shea, Hartford, Conn. (*Journal A. M. A.*, Dec. 19, 1925). He says that the relative opacity of a urinary calculus depends on the total molecular or atomic weights of its constituents and is influenced by its structure and thickness. Some urinary calculi having constituents of low atomic weights are negative to the roentgen ray. These include stones composed of uric acid, urates and triple phosphate.

PHYSICAL UNFITNESS*

Walter M. Anderson, M.D.
PORTLAND, ORE.
Lieutenant Commander Medical Corps, U. S. Navy

For the past three years the writer has been the medical examiner of all men applying for enlistment in the U. S. Navy and Marine Corps at Portland, Ore. The majority of the young men who applied for these two branches of the military service have been residents of Oregon, Eastern Washington and Northern Idaho. In compiling reports of men accepted and rejected physically some interesting facts have been disclosed.

Contrary to the idea which many people have, the physical requirements of the Navy and Marine Corps are not so exacting that a man must be nearly physically perfect to be accepted. Practically every man who applies for enlistment believes himself physically fit in every way but a record of rejections shows they are not.

Certain standards of height, weight, vision, hearing, chest expansion, etc., have been adopted and they are those of average young men of eligible ages (17 to 35 years). The ages of applicants vary from 17 to 35 years but I can safely say that 95 per cent of them are under 25 and about 90 per cent under 21 years.

Personnel for acceptance must meet the following requirements for height, weight and chest expansion. At 17 years the minimum height is 64 inches, the minimum weight 110 pounds and the minimum chest expansion 2 inches. Standard requirements vary with age, while the weight required varies with both height and age. A man over 21 years of age must be at least 64 inches in height and weigh at least 128 pounds without clothing.

An accepted applicant must have at least 15/20 vision in each eye without glasses but correctible to 20/20. Snellen's 20 foot test letters are used. No organic disease may exist in either eye. The acuity of hearing must be 15/15 in each ear, whispered voice or 40/40 watch test. No evidence of any acute or chronic auditory disease may exist.

During the time covered by this report 6375 young men applied at the Navy and Marine Corps recruiting stations at Portland for enlistment, and of this number practically 40 per cent failed to pass the physical examination. The causes for rejection were many but the important ones I shall enumerate.

Defective vision and other visual diseases, as is the general rule throughout the whole country, were the biggest factors in ruling out men from the military service. Nearly seventeen per cent of the total rejections were due to defective vision; 18 per cent were rejected because of deformities of the chest (depressed sternums, pigeon breasts or flat chests), deficient chest expansion, poor physique and underweight.

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* Read before Portland City and County Medical Society, Portland, Ore., Dec. 2, 1925.

The next important cause for rejection was defective teeth. It was a surprise to the examiner to find such poor teeth in the youth of this section. The standard requirements for teeth are at least twenty sound teeth, with at least four opposing molars and four opposing incisors. A properly filled tooth is considered a sound tooth. Thirteen per cent of those who were rejected failed to meet the requirements for teeth. Many of them showed extreme lack of care of their teeth and some of them scarcely had a sound tooth in their mouths.

Eight per cent failed because of flat feet and the examiner feels that he was quite lenient in passing upon the feet. Flat feet, when accompanied by symptoms of weak feet or when the foot shows weakness upon test, pronounced flat feet attended with marked eversion of the foot and bulging of the inner border due to inward rotation of the astragalus are all disqualifying. The examiner in nearly every instance attempted to instruct the applicant regarding the proper method to walk and stand in order to avoid increasing difficulty with his feet.

Seven per cent were rejected because of the defective hearing, acute or chronic middle ear infections or perforations of the tympanic membrane. Nearly 6 per cent (5.8 per cent) were color blind either green or red blind, sometimes both. Jenning's self-recording test was used to determine their color perception. About 5½ per cent were under the minimum height of 64 inches. Nearly 4 per cent were rejected because of some skin affection—scabies, eczema, psoriasis, pronounced acne and other disfiguring diseases. A little over 3½ per cent had some heart affection which eliminated them. About 3 per cent had herniae, of which the right inguinal type was the most common.

The examiner was lenient with goiter and only ruled out about 2 per cent of these applicants because of this condition. All men who were rejected for goiter had rather large growths or showed signs or symptoms of the toxic type. Venereal diseases were the cause of about 2 per cent of the rejections.

The remainder of the men who failed to pass had varicose veins, large varicoceles, hydroceles, hemorrhoids, enlarged and infected tonsils, defects of speech, nasal abnormalities, amputated fingers, hammer toes, stiff joints, curavtures of spine or other congenital or acquired deformities. Frequently applicants had a number of disqualifying defects, such as defective vision, underweight and infected tonsils, but in each case the most important defect was the one assigned as the cause of rejection.

Attention is called to the high percentage of rejections under headings of deformities, defective teeth and flat feet. The primary causes for these defects in the majority of the men examined were indirectly traceable to rickets and malnutrition in childhood. So I believe the pediatricians have a very big task before them to diagnose and correct these two conditions, if the children are to grow up physically fit to cope with the battles of this nation and of life itself.

It is a fact that the soil of this great Northwest is poor in lime as well as iodine. Special effort is made to supply the iodine needs of the body as a preventive of goiter. So, too, there should be something done to correct or make up for this dearth of lime and sunshine to prevent rickets.

In conclusion, I wish to emphasize the important role which I believe pediatricians must play in order to reduce the number of young men who may be considered physically unfit because of diseases and malnutrition of childhood. Ophthalmologists will have to let us know how to prevent the ever-increasing number of children with defective vision.
202 Dekum Bldg.

THE INFLUENCE OF FOCAL INFECTIONS. Notwithstanding that this paper by D. J. McCarthy, Philadelphia (*Journal A. M. A.*, Dec. 19, 1925), is the result of a careful analysis of 500 of his own cases, all studied in detail by one clinician, the opinions in reference to the influence of the focal infections, even in this group, are the impressions made on him by the results obtained in treatment, and, he says, are by no means facts, or to be taken as complete conclusive evidence of the direct causative relationship of focal infections to nervous or mental disease. McCarthy lays it down as a fundamental principle of therapeutics in mental and nervous diseases that, unless one has a definite theory of disease to work on, one need not expect results; to treat a mental state by drugs or psychotherapy, is to do little less than the Christian scientist would do in the same cases. He holds that a man or woman who was sane, had always been sane up to one month ago and is now insane, so insane, indeed, that he or she is in grave danger of confinement to an insane asylum, must have some real cause for this condition, and that this cause must be a definite chemical poisoning, either bacterial or visceral in nature.

MUCOCELE OF THE FRONTAL SINUS.

OPERATION AND RECOVERY*

MEARLE C. FOX, M.D.
PORTLAND, ORE.

Mr. N. came into my consultation room one day, and as I glanced up at his face, I said to my self, "there is a mucocele," and with this impression I started to work out my diagnosis. What was there about the man that gave this impression? It was the position of the left eye that was looking downward and the smoothing out of the folds of its upper lid; it was the visible tumor above the inner third of the supraorbital ridge; it was the lack of any signs of inflammation in any visible part of the eye or face and it was the narrowing of the palpebral fissure with no signs of swelling of the lids. These things taken together at a glance gave me the impression, "that is a mucocele."

A mucocele, as you know, may be defined as a retention and accumulation of a mucous secretion within a preformed cavity, the walls of which are lined with mucous membrane. Examples of this are the frontal sinus, ethmoid sinus, maxilary sinus, sphenoid sinus, etc.

The development of this condition depends as much or more on the anatomic relations, as on the pathologic condition of the sinus involved. It is for this reason that the frontal sinus is most frequently the seat of this trouble. The nasofrontal duct in its course to the middle meatus of the nose must pass between the numerous cells of the ethmoid, anyone of which, if for any reason it should become enlarged, may encroach upon the lumen of this duct, thus causing the retention of the secretion of the frontal sinus. As a rule this process goes on very slowly, hence the absence of symptoms. When it is once closed, it need not remain closed, but as the pressure increases it may overcome the obstruction, thus explaining the infrequent drainage in the present case. This drainage is incomplete and, therefore, the process of absorption of the walls may go on, even when a sinus still drains. When the duct is completely closed and remains closed, the accumulation begins and at this time, if not before, subjective symptoms are apt to appear, and as the accumulation increases the deformity is produced.

The underlying causes for this closure of the duct as enumerated by the different observers are many, among them the most important being injury, ethmoiditis and osteoma. Of the fourteen cases reported by Howarth,[1] five are attributed to injury, Killean has suggested this cause, Acomb[3] gives injury as the cause in his case report, and it seems quite probable that the case hereby reported was due to the same cause.

Turner[2] gives a catarrhal condition as a probable cause for some of his cases, and in some of them polyps were mentioned. Dabney[4] gives polyps as an essential to mucocele of the sinuses. More often, however, nothing of a pathologic nature can be discovered in the nose. Howarth,[5] in his report of his twenty-first case, gives as a cause a large osteoma, occupying the greater portion of the ethmoid and part of the frontal sinus.

This affection is characterized by the lack of symptoms rather than their presence. There may be an uneasiness, heaviness, prickling sensation, or a slight headache before any deformity occurs, or there may be nothing that can be recalled before the fullness or tumor around the eye was noticed. Epiphora is sometimes an early symptom.

The tumor generally comes in the inner angle of the orbit above the internal canthus, but may appear at any point over the frontal sinus. As occurred in the present case, the tumor was above the supraorbital ridge and near the upper limit of the sinus.

These tumors are very hard to palpation but not so hard as bone, for you get a sensation of elasticity on firm palpation. Generally there is no soreness to pressure, no redness and the skin is smooth and freely movable over the tumor.

If the floor of the sinus has given way, there will be displacement of the eyeball, the direction of which will be determined by the part of the floor that is gone, but the eye is generally directed downward and outward. As the disease advances, this becomes more marked and when the entire roof of the orbit is absorbed, as in this case, the eye is directed downward and pushed forward.

The excursion of the eyeball is limited in proportion to the amount of displacement and diplopia increases in the same proportion. If, as in this case, the tumor is very large so that pressure and traction are put upon the optic nerve, vision will be impaired but this is unusual, for the examination of the fundus generally gives negative results. The pupil reacts to light and distance and the palpebral fissure is narrowed, but rarely is there any redness or edema of the lids.

Notwithstanding the statement of Howarth to the contrary, the x-ray pictures may be of very

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* Read before the Annual Meeting of the Pacific Coast Oto-Ophthalmological Society, Vancouver, B. C., June 18-20, 1925.

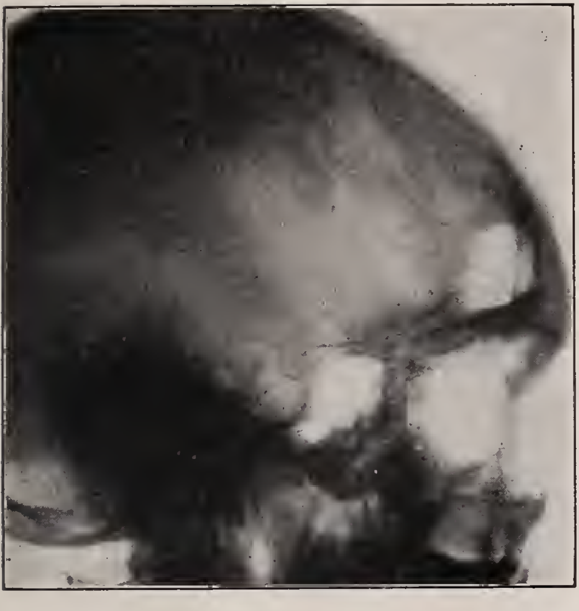

Fig. 1. Shows depth of frontal sinus.

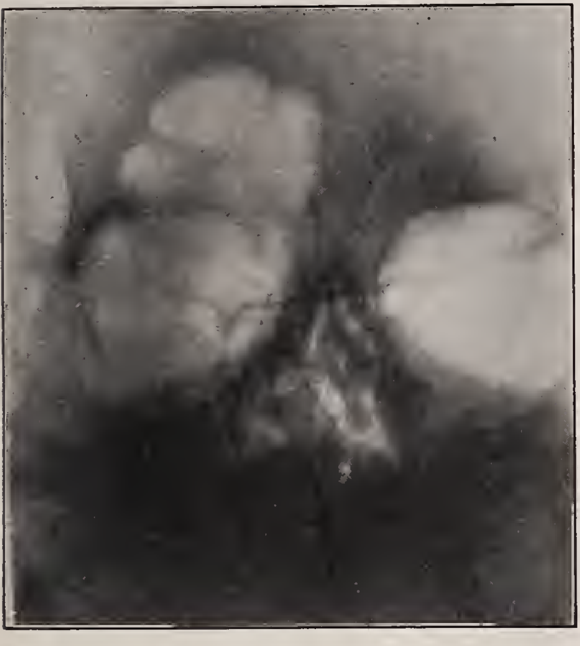

Fig. 2. (Retouched.) Shows faint outline of obliterated right frontal sinus.

great aid in arriving at a diagnosis. In this case the x-ray gave me as much definite knowledge of the condition as all the other things entering into the history of the case.

Through the lack of pain these patients are seen late. Although the condition may have been known to exist for years, they consult the physician only when their vision is impaired.

Still following my impression, I asked Mr. N. how long this condition had existed, and his reply was, "seven months." But in asking the superintendent for whom he works the same question, his reply was, "he had it when he came here nearly three years ago." So you see how indefinite the history may be. It is when the pain begins that they take notice and date everything from that time. Nevertheless the growth may have been going on for years.

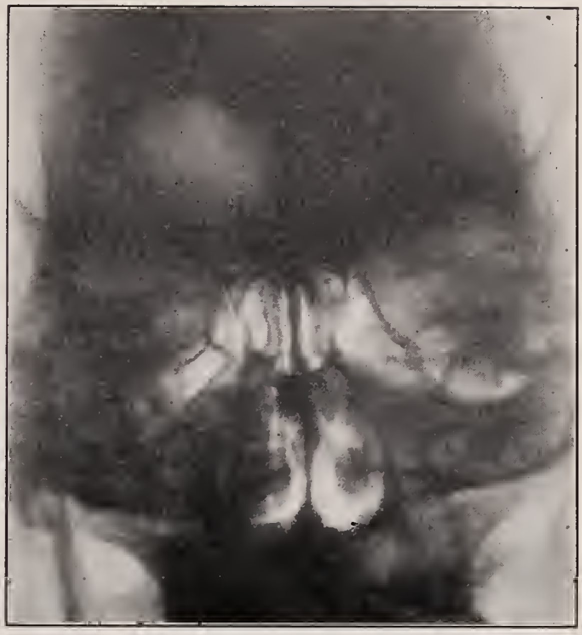

Fig. 3. Shows the distinct outline of the opening through the anterior and posterior walls of the frontal sinus.

This man, Mr. N, 54 years of age, a stationary engineer, when a boy of eighteen, met with an accident caused by falling off a derrick mast which struck him, fracturing his right leg in two places. His left shoulder and his skull were also fractured. The fracture of the skull passed anteroposteriorly through the right orbit and forehead, from which a slight groove still remains. Still further evidence is to be had by reference to the x-ray pictures which show the obliteration of the right frontal sinus, of which only the slightest trace remains.

The nose was broken and flattened to his face, from which a slight deviation of the septum resulted. The right eye was injured by lacerated wounds and was said to have been expelled from the orbit. The patient is said to have been unconscious for four hours, when he slightly recovered, then lapsed into coma lasting for three weeks. He also sustained a compound fracture of the femur which became infected and remained an open wound for six months.

His present illness, he says, is of seven months duration. But, as stated before, we know it has existed for over three years, and how much longer we have no record. His statements of his early symptoms are indefinite, but he says the tumor was larger at some times than others and at different times he has noticed a few drops of fluid gush from the left side of his nose, like it was being expelled under pressure, accompanied by no other symptoms than that his vision would improve for a time after this drainage, then gradually become worse again as the tumor would again increase in size.

Upon examination I found a tumor 3.5 cm. laterally, and 2.5 cm. vertically, situated 2.5 cm. above the orbital margin and the inner edge, 1.5 cm. from the median line. This tumor was quite firm yet slightly reducible and giving a sensation of fluctuation.

I put on a colodion dressing for twenty-four hours which reduced its size but when this dressing was removed the tumor rapidly increased.

On deep palpation I could outline a gap in the bone, 1.5 cm. wide, located 1.5 cm. from the median line and extending for 2-3 cm. upward and outward from a point 1.5 cm. above the edge of the orbit. This was confirmed by examination of the x-ray pictures. Through this opening there was no protrusion of the tumor at the time of examination, but it did protrude through another larger opening about 2 cm. in diameter above and to the outer side from the first. By deep palpation the edge of this opening could be made out.

The excursion of the eyeball was restricted in all directions except downward, double vision being produced above the horizontal meridian and at 20 degrees on either side. There was a proptosis of six mm. in the left eye. The fundi were negative except that both discs seemed a little pale. The palpebral fissure was very much narrower than the right, but the lids showed no signs of edema or inflammation.

The vision was 20/100 in each eye without correction and with +112′ C+37 at 90 in each eye he got 20/16 and 20/40 vision. There was no lateral deviation but marked left hypotropia.

The examination of the nose was negative except for a slight deviation of septum to the right. The Wassermann was negative and the white count was 8200.

The x-ray findings were as follows: The examination of the skull shows an absence of the frontal sinus on the right side and superficially what appears to be an enlarged one on the left. Careful scrutiny, however, reveals the fact that both tables of the skull are missing and that the border on the upper side is smooth. The upper rim of the orbit for about two-thirds of its extent is absent and the ethmoid cells appear to communicate with the sinus. The septum is deviated to the right and the turbinates on the left are hypertrophied.

Conclusions: The absence of bone from the inner table of the skull and the protrusion of the external table has been caused by pressure from a growth over a considerable period of time, the exact nature of which cannot be determined by the x-ray alone, but a cyst or mucocele is probably the cause.

Signed:
RALPH C. WALKER, M. D.

Operation. On January 16, 1925, the patient went to the Eye, Ear, Nose and Throat Hospital, where under general anesthesia an incision to the periosteum was made through the eyebrow from its outer extremity to the median line of the forehead, thence upward, following the lines of the skin, for 5 cm., thus forming a triangular flap. A curved incision about 2 cm. long, connecting with the first, was made downward to nearly opposite the inner canthus.

After a transverse incision through the periosteum was made a few mm. above and parallel with the supraorbital ridge, this triangular flap was dissected upward and outward, exposing the bone to the extent of the frontal sinus. The openings in the bone were found as outlined by the previous examination and the x-ray, but the upper one was larger than had been anticipated. A small perforation in the outer plate was found nearly to the outer extremity of the sinus, which did not show in the x-ray pictures, and contrary to the x-ray findings, the upper rim of the orbit was not absent and the anterior ethmoids did not communicate with the sac and only opened slightly into the cavity when the sac was removed.

The larger opening was through both the anterior and posterior walls of the sinus and the floor was gone entirely. Hence all three walls were involved and the tumor sac was adherent to tbe dura and orbital contents, from which it was removed by dissection. The cavity was further enlarged by the displacement of the soft tissues within the orbit, downward and forward.

The cavity was in the form of a triangle, the base being about 5 cm. deep, extending nearly to the apex of the orbit; the transverse measurement was about the same. It extended upward about 3 cm. and contained about 60 c. c. of thick yellowish gray mucus.

The sac was grayish white in color and rather tough, so that it was readily dissected from the boney walls, the dura and the orbital contents. After its removal it left an irregular cavity, shaped like a three-leafed clover, with the stem at the nasofrontal duct with no opening into the nose except two small places left open in the anterior ethmoid cells by the removal of the sac.

The periosteum was carefully retracted to the extent of the sinus and all the bone of its anterior wall was removed, the edges beveled and made smooth. The boney cavity was perfectly clean and quite dry, and as there was no secreting membrane left, the wound was closed without opening into the nose and without drainage except a strip of iodoform gauze left in the lower angle of the wound for forty-eight hours. A bandage was applied with sufficient pressure to force the orbital contents upward and inward to fill the vacant space under the bridge of bone left above the orbit.

The bacteriologic findings, as reported by Dr. John Le Cocq, are as follows: Mr. N. Culture of contents of frontal sinus.

Culture shows 60 per cent Gram-positive diplococci (diplococcus pneumoniac) and 40 per cent of a large gram, positive cocci occurring in tetrad formation (micrococcus tetragenous).

The pathologic report follows: Mr. N. Mucocele from frontal sinus.

Gross examination: The specimen consists of an irregular sac-like structure, measuring 1.5 by 2.1 by 3.1 cm. in its various dimensions. The wall is generally thin, measuring on the average of 2 mm. It is apparently largely fibrous tissue. The lining is smooth. The sac has previously been opened.

Microscopic examination: Sections of the wall of the specimen reveal it to be composed of densely packed old fibrous connective tissues cells, with considerable hyalin degeneration, slight necrosis and some blood pigment changes. In only a few places is there any epithelial lining. This is of the pseudo-stratefied type. The remainder of the lining is smooth.

Pathologic diagnosis: Mucocele.

Signed:
WARREN C. HUNTER, M. D.

I have discussed mucocele in general and given a rather extended description of the present case. I have gone to some length in describing the operative procedure employed for the cure of this condition. Now it remains to take up the last of the topic mentioned in the titles, recovery.

This began the moment the wound was closed. The patient had no pain or discomfort other than that caused from the pressure bandage, and asked to sit up the second day with the statement that he had worked many days when he had felt much worse. This was not permitted, however, due to the large area of exposed dura.

The temperature did not go above 99°. The sutures were removed on the fifth day and on the same day the patient sat up in bed with the wound entirely healed. On the ninth day he went home and returned to work three weeks from the time of the operation.

His present condition (March 12) is very gratifying. His exophthalmos is entirely gone, he has no more confused vision or headache. However, on close examination he shows 5 Δ of left hypotropia which is easily overcome by prisms 2 Δ in each eye with +87+37 at 120 degrees and +75+125 at 80 degrees, giving him 20/15 and 20/20 vision.

CONCLUSIONS

First, mucocele is a comparatively rare condition.

Second, this is a comparatively rare case of a comparatively rare condition.

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ACUTE SUPPURATIVE OTITIS MEDIA*

Archibald W. Howe, M.D.
TACOMA, WASH.

When one considers the frequency of this disease, the damage it does to hearing and its dangerous complications, the subject becomes most important. Inasmuch as we must diagnose and treat the condition properly and promptly, a comprehensive knowledge of the anatomy and physiology of the middle ear is essential, as well as the causes, pathology and symptoms of the disease. I will review these essentials as briefly as possible.

The membrana tympani forms the outer wall of the middle ear. The handle of the malleus is embedded within these structures. Hence the sound waves impinging upon the ear drum are transmitted to the handle of the malleus, and thence to the incus and the stapes, where the foot plate transmits them through the oval window to the sound perception apparatus. The tympanic membrane is of clinical importance chiefly on account of the various changes in its appearance in diseased conditions.

A normal drumhead is characterized by its pearly gray appearance and by the presence of the handle of the malleus, the short process of the malleus, the triangular cone of light and the anterior and posterior folds. The drum is made up of three layers, the external epithelial layer which is a continuance of the skin, a middle fibrous layer and an inner epithelial layer. This inner layer is lined with a ciliated epithelium, as is also the whole lining of the middle ear, the attic and antrum. The eustachian tube leads from the middle ear to the epipharynx and also is lined with ciliated epithelium. The action of the cilia is always toward the outer orifice of the eustachian tube. It is through this channel that nearly all middle ear diseases invade the middle ear cavity. The average length of the eustachian tube is one and one-quarter inches and the pharyngeal opening is one inch lower than the tympanic opening.

The tympanic opening is not in the most dependent portion of the middle ear cavity. This, however, does not interfere with drainage under normal conditions, as the cilia of the epthelium of the cavity sweep the secretions toward the opening of the tube and out through the tube to the pharyngeal opening. If, however, the cilia are impaired in their functional activity by inflammation or other morbid process, the elevated position of the tympanic orifice of the tube materially interferes with the drainage. Under these conditions the secretions are retained, decomposition follows and further irritation of the mucous membrane results. The function of the eustachian tube is two fold, ventilation and drainage of the middle ear. Ventilation is essential to equal pressure on the drum. Anything that obstructs the flow of secretions of the eustachian tube predisposes the mucous membrane of the tube and the middle ear to infection and inflammation. The two great underlying principles relating to etiology of inflammation of mucous membrane lined cavities are: first, the exciting cause of the inflammation is always a pathogenic microorganism and the second relates to those conditions which favor their growth as obstructive lesions, interfering with the drainage and ventilation of the cavity, thereby lowering the resistance of the tissues.

The predisposing influences on middle ear infections are the conditions that interfere with the natural action of the ciliated cells lining the eustachian tube and the ventilation of the middle ear. Nasal obstructions from any cause are injurious and diseased conditions in the pharynx all retard inner ear aeration. Both conditions are particularly menacing to the middle ear during the course of acute infections, because there tendency is to retain infectious material and by becoming swollen and obstructive they tend to facilitate infections into the eustachian tube. Most common of these conditions are adenoids, polyps and sinus infections.

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* Read before Pierce County Medical Society, Tacoma, Wash., Feb. 26, 1925.

Infectious diseases predispose to middle ear disease. The tendency of all infectious diseases to infect the middle ear through the eustachian tube depends on the fact that the membranes of the upper respiratory tract are involved, as for example, in measles, scarlet fever and influenza. Each disease supplies its own brand of organism, and the ear is never free from danger during the period of such infection. Any rise in temperature during the convalescent period of these diseases, if unaccounted for otherwise, should make one suspicious of ear infection. Pneumonia is also frequently complicated by middle ear infection and it is in pneumonia that otitis media and mastoiditis frequently develop without pain. Because of this fact it was made a rule in some of the army camps during the war to inspect the ears daily in pneumonia cases.

Measles during the epidemics at the camps proved a great forerunner of middle ear infection, and it stands by itself as an etiologic factor in the development of the severest types of the disease. During the epidemic at Camp Shelby measles accounted for forty-four cases of mastoiditis out of a hundred and twenty-three cases reported. Seventy-three per cent of all cases in which a pure culture was obtained proved to be streptococcus and sixteen per cent staphylococcus. Eight of the twelve deaths reported had had measles. Seven of these twelve cases reported streptococcus viridans in pure culture, three hemolyticus, and two were of mixed infection.

The early stages of acute purulent otitis media are usually monobacterial in character. The inciting factor in the disease is the organism isolated in pure culture, when the culture is immediately taken after incising the drum or after a spontaneous rupture.

Streptococcus pyogenes, streptococcus hemolyticus, streptococcus viridans, pneumococcus and staphylococcus are the organisms most commonly isolated. The streptococcic types are the most virulent and destructive to both soft and bony tissues and unfortunately the most frequent. The hemolytic type is very often related to lung and pleural infections, as was demonstrated during the influenza pandemic.

Pathology. When the determining factor of the disease enters the eustachian tube, the mucous lining swells and the tube tends to close. Secretion increases and the organisms thrive in the exudate produced and this fills up the middle meatus. Pressure on the drum takes place, and unless relieved the exudate takes the path of least resistance and infects the mastoid antrum and adjoining cells. The drum appears red, sometimes a very dark red and there may or may not be bulging, but the normal landmarks have disappeared.

Symptoms and diagnosis. With a few exceptions the onset is sudden, following grip or so-called cold or during some stage of one of the previously mentioned diseases. There is at first a feeling of fullness in the ear, an obstructive feeling in the canal and hearing is usually impaired. The patient sometimes states that his own voice seems louder and occasionally there is cracking noises or buzzing in the ear. The onset of pain comes on with closure of the eustachian tube and filling up of exudate in the middle meatus. The exudate is at first a thin serous fluid. Bulging of the drum usually takes place and pain becomes more severe. Pain is steady and boring in character.

Temperature in adult cases is not a reliable guide or an aid to diagnosis. In these cases it may be very slight or not present at all. Many an adult case runs no temperature, even through to mastoid involvement. In children temperature is a fair guide in following a case. It may be our only symptom sometimes in children and when unaccounted for should make us suspicious of ear trouble.

When a rise of temperature persists after the drum is opened wide and drainage seems good, the question as to whether or not the disease has spread beyond the middle meatus becomes one for serious consideration. If the general condition is good, with little or no pain, no tenderness over the mastoid, there is usually no cause for alarm or immediate operation. Fever sometimes continues until the body resistance establishes itself. And, again, the original factor, the rhinitis or other infection, has not yet subsided. But the temperature usually drops when good drainage is established.

At first the discharge is serous and profuse, and as the disease progresses it becomes purulent. Drainage of the middle ear in the early stages often takes place through the eustachian tube. This is especially so in children and for this reason suppuration and discharge through the drum is often delayed. Discharge is constant if drainage is good. Where intermittent, it suggests a too small opening in the drum. Abundant intermittent discharge in later stages suggests mastoid involvement. Under proper treatment and favorable conditions, discharge ceases in two or three days to as many weeks. Cases in which the discharge lasts longer have a deeper infection and in many the mastoid cells may be infected. In cases resolving favorably, the drum grows paler, the malleus becomes visible and hearing gradually returns to normal. Unfavorable cases and those not treated promptly develop mastoiditis and other complications. Some resolve into chronic otitis media with destruction of the drum, bone necrosis and defective hearing.

The early symptoms in children are temperature, earache, red or bulging drums, deafness and noises. In adults, deafness or a feeling of fullness in the ear may be the only symptoms.

Should we find on examination that the patient flinches when the lobe of the ear is grasped and he complains of more pain, we must always be suspicious of furunculosis in the canal. Examination of these reveal normal hearing and, if the canal is not swollen shut, a normal drum. Both furunculosis and acute suppurative otitis media may reveal pus in the canal. Pus from the former never pulsates, while in early middle ear infections the pus usually is seen to pulsate. This point is especially well to remember in children, as a good examination in these cases is always difficult. Under favorable conditions of good general health and early opening of the drum, the prognosis is good for early cessation of discharge and for recovery of hearing. It is always well to be guarded in prognosis for the first few days. Culture taken at the time of opening the drum is always an aid to prognosis.

Treatment. If on examination you find a drum slightly red and no bulging, a warm solution of 5 per cent carbolated glycerine may be used in the ear. Apply heat, with rest in bed. A laxative is advisable. If pain is not relieved, open the drum whether there is bulging or not. A drum should never be allowed to open itself. Nature's opening is usually small and misplaced and gives poor drainage. Edges of a ruptured drum are rough and healing very often is followed by scars, while a clean incision is followed by little or no scarring.

Where anesthesia is safe, it should always be used in opening the drum. (Gas and ether are best). With patient asleep, head mirror on, light in place, and lance ready, you incise in the posterior inferior quadrant of the drum. Incise upward or downward in an outward curve to the periphery. By incising in this manner the circular muscular fibres are severed. This causes gaping of the wound and incidentally good drainage. In case a smaller opening is being made larger, the incision should start in the old opening. A drum incision should measure about three-sixteenths of an inch in length.

After incising, wait a minute to allow the bloody discharge or pus to run out, then wipe the canal and drum clean. Insert a small piece of sterile gauze or absorbent cotton. Carbolated glycerine solution does not help at this stage. It only mixes with the discharge and comes out and sometimes interferes with drainage.

The best treatment from now on is the so-called "dry treatment," wiping the canal and drum clean just as often as discharge fills the canal, every half hour if necessary. It is a good plan to insert a coarse mesh one-fourth inch wick sometimes, as this facilitates drainage. Douching at this stage is bad practice and should not be considered. At best it only cleans the external meatus and does more damage than good. It spreads the infection in the middle ear, and many times forces infection further into the attic, antrum and mastoid cells. Dry treatment is so-called because it is just the opposite from the old douching methods.

Inflation of the ears at this stage is another bad practice. Drainage of the middle ear also takes place through the eustachian tube by the action of the ciliated cells lining the tube. Inflation, like douching, spreads infection and forces the infection or draining pus back into the middle ear.

The first day or two the discharge is usually thin and blood stained. Then it becomes less profuse, thicker and yellow in character. Ordinarily cases clear up in a week or ten days. Cases which last longer should see an ear doctor. In these cases suction may be used and mercurochrome instilled. Continuous thick creamy discharge after two weeks may mean bone necrosis and *mastoid involvement*, but this, of course, is the beginning of another subject.

CARBON DIOXID AS AN AID IN GENERAL ANESTHESIA. Personal experience has convinced John S. Lundy, Rochester, Minn. (*Journal A. M. A.*, Dec. 19, 1925), that carbon dioxid in moderate concentration assists in producing anesthesia, rendering the anesthetic apparently safer and easier to administer. Carbon dioxid should be used in such concentrations as will produce optimal results, and these vary with the individual and the type and stage of the operation. Too much carbon dioxid is worse than none, and care should be exercised to prevent more than 5 per cent being used.

THE MEDIASTINUM AS A FOCUS OF INFECTION*

W. L. McClure, M.D.
YAKIMA, WASH.

INTRODUCTION

To discuss mediastinal infection as a whole would be presumptuous of me, when the subject in its various phases has been so thoroughly covered in the recent literature. Also, this period of our meeting is not a fit time for any lengthy discussion. Therefore, I shall confine myself to a phase of this subject which has proved of a great deal of interest and of some practical benefit to myself and colleagues.

In the past influenzal period of 1920, before much emphasis had been laid upon the mediastinum as a participant in respiratory infection, I was baffled by a number of patients who consulted me regarding symptoms of recurrent general infection. The history given was usually one of easy fatigue, both mental and physical; muscle and joint pain, especially lumbar; recurrent temperature; usually cough and there was commonly a history of influenzal infection. Many of these cases had had all evident foci of infection, such as teeth, tonsils and sinuses removed or properly treated. In many of them ordinary physical findings of the thorax, such as revealed by percussion and auscultation, were wanting. Blood cultures frequently were positive, usually giving a growth of staphylococcus aureus.

At this time I was fortunate enough to be associated with Dr. Cornett and it is due to his assistance that we have been able to arrive at a fairly definite conclusion regarding this type of case, for I do not believe that a diagnosis of this group of symptoms is complete without fluoroscopic and radiographic aids.

HISTORY

As stated before, there is usually a history of acute respiratory infection, generally influenza in varying degree, but occasionally of tonsillitis, sinusitis, pneumonia, or even teeth infection, followed by a partial or even apparently total convalescence, then periods of exacerbation, characterized by the symptoms mentioned later.

BACTERIOLOGY

Sputum examination usually shows a mixed infection, with staphylococcus aureus and streptococcus predominating. Blood cultures show positive in about twenty per cent of the cases, the organism being the staphylococcus aureus. Of course, the absence of the strepococcus in the blood culture may be due to the cultural methods employed. But the writer is inclined to believe that in this locality at least, the staphylococcus plays a much more important part than it has seemed to in the cases reported through the middle west and east.

SYMPTOMS

The subjective symptoms during the exacerbations are usually of a "grippe"-like nature. Cough is nearly always present, as is muscle and joint pain. Frequently there is definite pain in some of the peripheral nerve trunks. In long standing cases in adults there is complaint of cardiac oppression, tachycardia or arrythmia. Usually there is some degree of gastric or intestinal disorder complained of. Two of the patients had unmistakable symptoms of duodenal ulcer. Chest pain is an inconstant factor.

PHYSICAL FINDINGS

These are not constant and repeated examinations may be necessary to finding anything definite. Rales are usually of the mucous type and typically heard most readily in the axillary line. Where there is much hilus density, I believe there is hyperresonance. Where there is much peribronchial thickening, the rales may be crackling or whistling and easily heard both anteriorly and posteriorly over the bifurcation areas. In the absence of renal involvement the blood pressure is usually lower than normal. Nearly all cases show some evidence of myocardial change, usually broadened area increased more to the right.

ROENTGEN FINDINGS

These in themselves are not in any way diagnostic, but appearing as they do in the type of patient just described, and changing as they do under treatment, make a showing that is, to say the least, characteristic.

They are mainly fluoroscopic and correspond to the usual findings of upper respiratory infections, principally areas of increased hilus density, bilateral and very frequently with one being markedly darker than the other; or peribronchial infiltration, varying from the simple types found with bronchitis to the various degrees of bronchiectasis. Occasionally areas of increased density are found throughout the lungs themselves, suggestive of bronchopneuomonic spots or areas of unresolved lung inflammation. Glandular shadows are prominent. Shadows due to increased density in the mediastinal areas nearly always are to be found and we have had one case of a diffuse thickening, suggestive of the fibrosis described by Sante as cirrhosis.

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* Read before the Thirty-sixth Annual Meeting of Washington State Medical Association, Seattle, Wash., Sept. 17-19, 1925.

The rather characteristic signs of tuberculosis are nearly always lacking, although when these signs suggestive of tuberculous involvement, either recent or old, active or healed, are found, we are very cautious about making a final diagnosis and still more cautious with treatment for reasons which will appear later, until a definite diagnosis can be made.

This point is important. The thickening, densities and glands under the fluoroscope are *darker*, more extensive and irregular than we would find in the average chest. Also, as treatment is instituted and the case progresses toward recovery, this unusual darkness tends to lessen and frequently disappears entirely; the lungs and bronchial tissues seem to lose their appearance of stiffness and rigidity; air enters the lung tissues more freely and the thickened hilus, peribronchial and gland shadows move more freely with each respiration.

LABORATORY FINDINGS

Mention has been made of the bacteriology. Blood counts taken during acute periods seem to vary with the predominance of staphylococcus aureaus or streptococcus. In the case of the former there is usually a polymorphoneuclear increase. In the latter, and especially in old cases, there may be little or no increase of leucocytic and lymphatic increase. Smears and cultures of sputum should always be made.

DIFFERENTIAL DIAGNOSIS

There must be no definite diagnosis made of mediastinal infection as a causative factor of the conditions described above until several other factors have been carefully eliminated. Infected teeth must be eliminated, tonsils carefully inspected and removed if necessary, sinuses transilluminated or radiographed and drained, or otherwise treated if infected. Hilus tuberculosis is especially hard to eliminate and repeated examinations of sputum may be necessary, together with a careful plotting of a temperature curve and intensive study of radiographic findings. Early malignancies, especially lymphadenomata, are often accompanied by some degree of secondary infection and cannot be identified at one sitting, but must be observed as to rate of development, creation of pressure symptoms, etc. Benign neoplasms, such as dermoids, must be similarly excluded. Chronic bronchitis, unresolved pneumonia, bronchiectasis, all must be considered and eliminated. Renal, gallbladder, appendiceal and colon infections must also be considered as a routine.

PATHOLOGY

This is rather obvious from the beginning description of the roentgen findings and of the bacteriology. The infection may be secondary to those of the upper respiratory tract or of the oral cavity. Or it may be the holdover of a primary bronchial or pulmonary involvement. The glandular involvement seems to be a hyperplasia, occasionally developing into actual suppuration, as described by Hare.

This was well illustrated in the case of one patient, a woman of 40, with a history of influenza, who came in complaining of a persistent cough. An area of considerable density was located in the right hilus and, because of considerable leucocytosis, the patient was told she would probably finally cough up a good deal of pus. About two days later this prediction was verified, the patient stating that she had a violent attack of coughing just after lying down, which resulted in the raising of about a half cup of blood tinged pus. Her symptoms subsided after this and she made a gradual recovery.

During exacerbations one of the most striking features is frequent finding of areas that suggest bronchopneumonic areas. The amount of fibrosis is frequently out of all proportion to the amount of adhesions present.

The greatest involvement seems usually below the third interspace. The persistent toxemia and the retardation, due to fibrosis, and the extensive peribronchial thickening seem to combine to cause a typical widening of the right heart.

TREATMENT

This varies according to age, general condition, occupation, etc. An effort is made to clear up all oral and upper respiratory infection, if any exist. The patient is placed on a supportive treatment and his hygiene regulated as far as possible. Where reaction is favorable, an autogenous vaccine, secured from sputum or blood culture, is employed. Iodine in some form seems to be the best medication, but certain types of goiter and tuberculosis must be carefully eliminated. If these exist, we usually employ glycerophosphates hypodermically. In several cases complicated by arthritis we have secured very good results by the administration of sodium iodide intravenously.

Finally, let me impress upon you the following facts:

1. That the mediastinum and adjacent structures may act as a definite infection focus with resultant toxemia and bacteriemia.

2. That by careful study this focus can be recognized.

3. That the staphylococcus aureus, in this locality at least, plays an important, if not more important a role than the streptococcus.

THE INSULIN TREATMENT OF DIABETES COMPLICATED BY DUODENAL ULCER

Blair Holcomb, M.D.
PORTLAND, ORE.

The following report is published because it serves to emphasize a number of important new problems associated with the insulin treatment of diabetes complicated by duodenal ulcer.

Peptic ulcer with diabetes is rare according to Joslin.[*] He reports no instance of ulcer in 2700 cases of diabetes. The past year (1923), however, six came to his attention. Only one requiring insulin was treated medically. It is only fair to assume that in such a large series of patients, peptic ulcer must have been present, although unrecognized. More complete search with better roentgenologic methods undoubtedly accounts for the recognition of a greater percentage of ulcer in his second series.

Unless the ulcer symptom of pain is predominant and persistent, it may easily be disregarded in the face of the diabetic symptoms. Joslin emphasizes three causes of hunger pain in diabetes: first, the gnawing distress of a neglected diabetes; second, pain associated with undernutrition; and, third, hunger contractions caused by a hypoglycemia. Ulcer complicating diabetes may simulate in many respects any of the above and offers some excuse for neglecting to recognize the pain as due to a gastrointestinal lesion.

Mrs. L., 48 years old, had what her physician called a mild influenza in May, 1924. Shortly afterwards typical symptoms of acute diabetes began. In four months she lost eighteen pounds from her normal weight of one hundred and fifty pounds. Her past history was entirely normal except for an acute appendicitis seven years before, when the appendix and one ovary were removed. No history of subsequent gastrointestinal distress was given.

She was 5 feet 3 inches, and weighed 127 pounds. Marked dental and tonsil sepsis were present. The blood pressure was 150-82. The urine contained large amounts of glucose and acetoacetic acid. The red and white blood counts were normal and the blood Wassermann was negative. The fasting blood sugar was 210 mg.

In the hospital, on a 1500 calorie diet, containing 91 grams of glucose, she excreted an average of 13 grams of sugar, but acetoacetic acid disappeared. The urine was desugarized by using 50 units of insulin and simultaneously raising the diet to 2000 calories, carrying a glucose value of 125 grams.

The tonsils were removed under local anesthetic without producing glycosuria and later several abscessed teeth were extracted. After several days the patient was sent home on a diet of 2600 calories and 44 units of insulin. Her weight had increased to 132 pounds. Reference to Chart I will show the progress of the diabetes.

She returned ten days later, complaining of epigastric pain when the stomach was empty; namely, at 11 a. m., 4 p. m., and occasionally at 2 a. m. Searching her memory, she recalled similar attacks, beginning about five years before. Alkali relieved her distress immediately and food had the same effect.

In patients taking insulin, gnawing pain at the above hours is not an uncommon complaint, usually signifying a hypoglycemia. The two other causes of epigastric distress mentioned above were not present, as her blood sugar was normal at the time of the pain and she was receiving an adequate diet. Moreover, the history dated back before the beginning of the diabetes.

A roentgenologic gastrointestinal study revealed a constant, tender duodenal defect. The films of the gallbladder were negative. There was no food retention at three hours.

The absence of food retention we considered an important factor in deciding the form of therapy. Severe insulin reactions have occasionally been seen, caused by six hour gastric stasis, associated with transitory motor disturbances of the gastrointestinal tract. Patients have been observed in severe insulin shock, and later, after having been revived, have vomited food eaten eight to ten hours before. The medical treatment of ulcer with obstruction, when there is no assurance that food will be absorbed in the normal time and the administration of insulin with no glucose to buffer it, would be a dangerous procedure.

The patient was presented frankly with the rather drab picture of medical ulcer management in its minutiae. We considered it impractical to add this absorbing task to the already rather heavy program of food weighing and the injection of insulin. She was, therefore, advised to be operated on. However, she decided to undergo medical treatment.

The diet at this time consisted of carbohydrate 36 grams, protein 57 grams, and fat 218 grams. The milk and cream mixture of the Sippy ulcer management consists of 60 grams of each, 13 times a day. Calculating the carbohydrate, protein and fat of this diet, it is respectively 70, 47, and 187 grams. It is seen at a glance that such a mixture lends itself easily to the requirements of a balanced antiketogenic diet, so that it is necessary to add only a small amount of bread, butter and an egg to make the diet conform with the previous diet.

Insulin adjustment did not prove to be a serious problem. The dilution of the diet and the spreading it over twelve hours in hourly meals did not necessitate the division of the insulin dose into more than three parts. In fact, after the first four days of the milk and cream diet the addition of pureed vegetables, cereals and eggs permitted a relative concentration of the food into three small meals, and the giving of smaller amounts of milk and cream between these, so that the insulin could be given in two doses, five-eighths of the total dose before breakfast and three-eighths before supper.

The influence of high alkali administration in raising the plasma bicarbonate had an appreciable effect on the value of insulin unit. During the weeks that alkalies were given it was necessary to lower the insulin dosage slightly. This effect may have been due to the relative dilution of the diet. Hypoglycemic reactions developed at only one period, one month after beginning the ulcer management. These were slight and came at 11 a. m. and 10 p. m. Adjustment of the dose readily stopped them. Gastric aspirations at 9 p. m., two hours following the last feeding, rarely contained more than 30 ounces of fluid and seldom any food particles.

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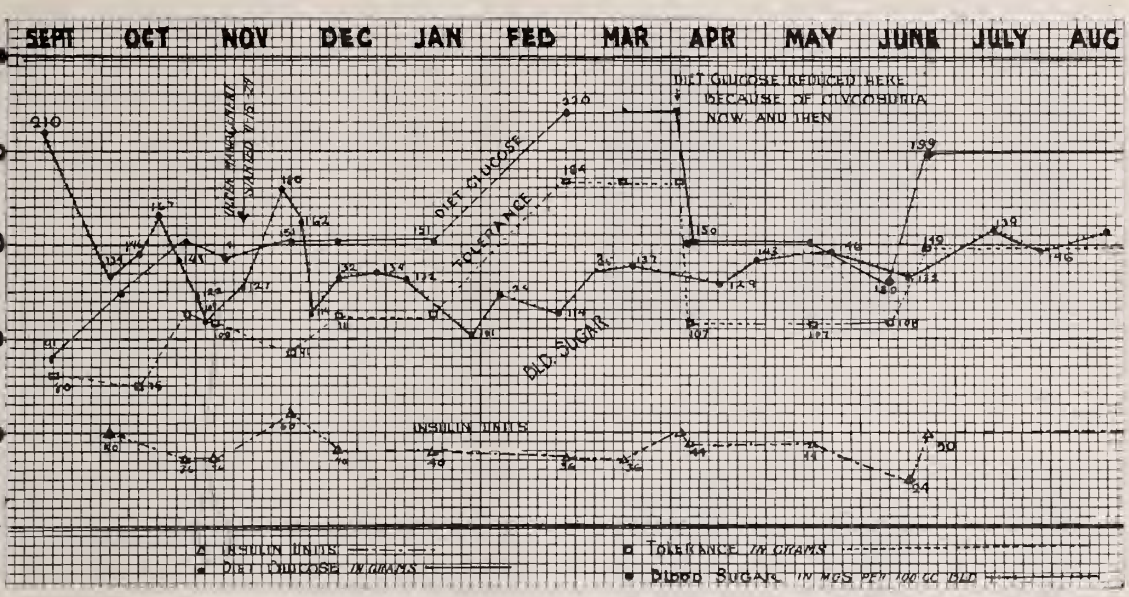
[*] Joslin, page 602, 1923.



DETAILS OF THE PROGRESS OF PATIENT

Complete relief from all ulcer symptoms was immediate and persistent. Monthly roentgenologic examinations over a period of ten months have always shown absence of spasm and tenderness about the duodenum, but no visible decrease in the size of the ulcer defect. The diabetes has been readily controlled and the patient has regained her normal weight.

The problem of selection of cases suitable for medical ulcer treatment is a broad one with many angles. Laying aside the consideration of possible malignancy in gastric ulcer, obstruction, perigastritis, perforation or recurring hemorrhage, complicating cholecystitis, the fidelity of the patient to the long treatment calls for a careful study of the individual and his occupation. Diabetes necessitating insulin does not simplify the problem. Taking milk and cream and alkalies at half hour intervals, aspirating the stomach nightly are not compatible with a normal occupation.

It is of incidental interest to note the effect in this patient of the high carbohydrate, low fat diets on the value of the insulin unit.** Reference to the chart will show an apparent rise in tolerance when the high carbohydrate diet was started. In reality there was actually no rise in the ability of the patient to burn glucose, as it is noted that when the low carbohydrate diet was again resumed the tolerance apparently dropped to its former level. The two diets were isocaloric but the carbohydrate grams were increased at the expense of the fat. Further reference will be made to this in a later paper.

The good end-results in this patient are due entirely to her willingness and ability to devote much of her time to carrying out a detailed program. One rarely finds this persistent cooperation even in medically treated ulcer patients without diabetes. It can be stated, therefore, that except in isolated, selected cases the surgical treatment of peptic ulcer without obstruction is preferable, as it immeasurably reduces the burden of treatment to the patient. Moreover, peptic ulcer with obstruction in an insulin diabetic should not be treated medically because of the danger of hypoglycemia.

Stevens Building.

** Mention is made of this because of work done by Sansinn, not yet published.

MERCUROCHROME-220 AND GENTIAN VIOLET

THEIR EXPERIMENTAL USE INTRAVENOUSLY

W. J. Pennock, M.D.
AND
Charles Ferguson, M.D.
SPOKANE, WASH.

There have been many reports in the current medical literature concerning the use of mercurochrome-220 and gentian violet intravenously. Some observers report excellent clinical results. Other observers, using the same technic in the same cases, obtain no results. Where such divergent results are reported, it is evident that more experimental work is necessary before the value of this method can be established. Practically all of the investigators attribute their results, if any, to the bacteriostatic and the bacteriocidal properties of these drugs.

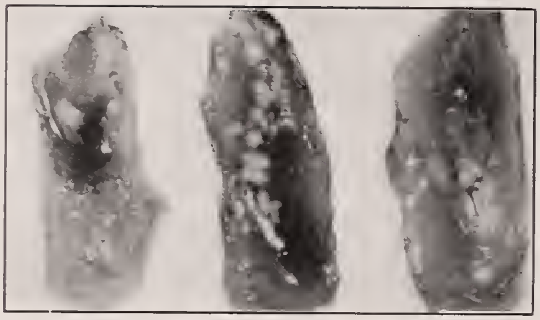


Fig. 1. Mercurochrome serum from rabbit, 48 hour growth. a, B. prodigiosus; b, staph. aureus; c, B. coli.

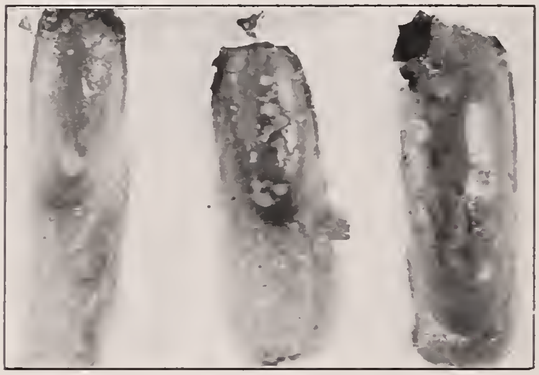


Fig. 2. Gentian violet serum from rabbit, 48 hour growth. a, staph. aureus; b, staph. aureus; c, B. coli.

In order to determine the bacteriostatic power of the blood serum after the introduction of mercurochrome-220 and gentian violet, we have been doing the following experimental work.

EXPERIMENTAL WORK

Half-grown vigorous rabbits were used. These were intravenously injected with freshly prepared, 1 per cent solution of mercurochrome-220, 8 mg. of the drug per kilo of weight. They were then bled asceptically into sterile centrifuge tubes, at intervals of five minutes up to forty-five minutes after injection. The cells were thrown down and the serum drawn off into small culture tubes. One-half of the culture tubes were slanted in the insipissator and the serum coagulated at a low temperature. The other half were not treated or altered in any way. These undiluted serum tubes were then inoculated with staphylococcus aureus, B. coli and B. prodigiosus.

The same procedure was followed with gentian violet with the exception that 0.4 per cent aqueous solutions, instead of 1 per cent, were used. Eight milligrams per kilo of body weight were used.

RESULTS

No reactions following injections were noted in any of the animals. The mercurochrome was noticeable in the urine five minutes after injection. The serum of the mercurochrome injected animals was also colored a marked pink.

In the case of the gentian violet injected animals, the gentian violet was not grossly discernible either in the urine or in the serum.

All of the organisms grew luxuriantly in the undiluted fluid serum and on the coagulated slants. We append the photographs of a few of the inoculated slants. We are starting a series of experiments, wherein the drug and a suspension of bacteria are injected simultaneously, the animals bled at intervals and the serum incubated.

CONCLUSIONS

Mercurochrome-220 and gentian violet do not have bacteriocidal or bacteriostatic power as used in these experiments.

201 Paulsen Bldg.

GRANULOMA INGUINALE

REPORT OF A CASE

J. F. Scott, M.D.
YAKIMA, WASH.

The patient, D. E., aged 67, had had several attacks of urinary retention; he came to the hospital and after three days of inlying catheter was operated on August 17, 1925. Caudal and transsacral anesthesia was used, and a suprapubic prostatectomy done without trouble and very little shock. A suprapubic tube was introduced. This remained dry and the dressing changed on the third day.

At this time the wound looked angry, with a definite ridge down each side of the incision, and a raised circular moat about each stitch hole. About the sixth day some urinary leakage occurred. The wound was again dressed, and the entire area was now one sloughy mass which was grayish in color, and included all the stitch hole surface, bled easily, the leaking tube coming from a grayish crater. His general condition was good, but he complained of a burning sensation in the denuded skin area. The tube was removed, mercurochrome 2 per cent used freely and urotropin internally continued. During the next three weeks a great amount of sloughy material came from the wound, so much that I feared the entire bladder was gangrenous. There was no odor, no great pain, nourishment was well taken.

Various local antiseptics were used without result, the broken down surface was spreading, no glandular involvement. Wassermann was negative; it did not look malignant. A grayish diphtheritic-looking membrane about one-eighth of an inch thick could be peeled off easily and without much pain. This did not remove the local hairs, but the edges of the incision had fallen apart. He was growing anxious. In the fifth week he developed a left-sided epididymitis, followed by suppuration. The pus was evacuated and this healed without the incidence of granuloma formation. Early in the case we noted that the sacral needle holes had given no trouble. At the end of the eighth week he was in a desperate condition. Anxious only to be let alone and die.

An article by R. R. Best[1] on granuloma inguinale showed a picture very like his and we gave him at once 2 c.c. of 1 per cent solution of tartar-emetic intravenously, followed by 3 c.c. in two days and 5 c.c. the sixth day. By this time some improvement had occurred. In all, nine injections were given, some in the back muscles. In thirty days he was entirely dry and smooth, with bladder function as good as the ordinary recent prostatectomy. Undoubtedly this was an autoinfection.

In the past ten years numerous articles have appeared on the subject of pudendal granuloma. Fraser[2] reports eighteen cases, in which there was no tendency to healing, but no great impairment of health. Antisyphilitics are without effect. Curettment, cauterization and excision are followed by speedy relapse. Heliotherapy and radium do not affect the condition. He had some successes with tartar emetic intravenously, but states that in no case did he see the rapid healing that some observers have reported.

Johns and Gage[3] report that an exhaustive study in fresh preparations, various suspension fluids, smears and secretions, have failed to add anything new to the bodies first described by Donovan in 1905. The organism is probably a protozoan parasite, and not an encapsulated bacillus. They report frequent relapses after apparent cure by antimony, and advise subsequent courses of treatment.

While granuloma has been recognized as occurring most frequently in the tropics, it is probably endemic the world over, and there seems to be no limit to the area of the body that may be involved.

Horwits[4] states that children and those above 45 years rarely have the disease. Race plays no part in susceptibility.

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TRANSPLANTATION OF THE URETERS INTO THE RECTUM OR BLADDER

A SUGGESTION FOR THE IMPROVEMENT IN TECHNIC

Wayne J. Stater, M.D.
PORTLAND, ORE.

After transplantation of the ureters into the rectum or bladder it is desirable to obtain a uniform pressure in the viscus into which they are transplanted. It is also desirable to keep this viscus in a state of inactivity while the process of healing goes on. When the ureters are thus transplanted submucously, the function of the organ into which they are transplanted is altered somewhat temporarily. The ureter, being a relatively delicate tube, cannot be firmly sutured into its new position. It is desirable, then, to obtain a constant intraintestinal or intravesical pressure for a few days, following this operation. If this desideratum can be realized, the effects of alternate distension and contraction of the viscus on the wound can be obviated.

A uniform intraintestinal pressure can be obtained by placing a rectal tube above the site of the ureteral implantaiton into the rectum. At the same time this procedure will keep the organ in a state of inactivity. A uniform intravesical pressure can be obtained by the use of the inlying urethral catheter. This procedure will tend to keep the bladder in a state of inactivity. Whether the ureters be transplanted into the rectum or other portions of the bladder, the catheter should be allowed to remain in either position until the ureters are fixed by the usual process of healing.

If inlying catheters can be used when the ureters are transplanted, it is necessary to prevent their occlusion for a period of about seven days. They may not become occluded, even though nothing is done, but it is best as a prophylactic measure to irrigate through the catheters twice daily, beginning a day or so after transplantation of the ureters. Meticulous aseptic precautions are observed.

During the transplantation of the ureters the distal end of each ureter is firmly anchored to the inlying catheter by a circular ligature which is tied firmly, so that this portion of the ureter will slough off, allowing the catheter to be withdrawn without resistance. If the inlying catheter becomes occluded before the end of the ureter sloughs off, it becomes necessary to remove it within a short time. This requires an exact procedure. The end of the inlying catheter which projects from the rectum is threaded through the lumen of a proctoscope which is then inserted into the rectum to the point of exit of the ureter into the lumen of the rectum, so that the distal portion of the ureter comes to lie inside the proctoscope. The ligature about the end of the ureter which anchors it to the inlying catheter is then severed within the proctoscope by the use of a long knife, thus preventing injury to the bowel wall. The inlying catheter may then be withdrawn by gentle traction. The same procedure is repeated for the second ureter, if both ureters have been transplanted at the same time.

TENIA SAGINATA

A NEW METHOD OF TREATMENT

J. SHELLEY SAURMAN, M.D.
SALEM, ORE.

Therapy of most value is one capable of brief description, quick execution and expeditious results. The method so nearly uniform in description by books on therapy in ridding the human body of tape worm by starvation, oral administration of nauseating drugs and purges, and the long wait between tenifuge and saline may be obviated by the procedure about to be described.

A patient presented herself with a few segments of tape worm passed the previous morning. She gave the history of having been treated unsuccessfully upon several occasions during the past fifteen years.

As this unsuccess seemed, in part, at least, caused by her failure to retain the drug administered, due to its extreme obnoxiousness, the suggestion presented itself to ignore the stomach by passing a duodenal tube, thus serving the several purposes of preventing gastric irritation, any effect the gastric secretions might have upon the drug, and of bringing the latter into quick and direct contact with the worm. A second thought, that bile in increased amount and concentration is claimed by some authorities to be particularly objectional to the parasite and carried into practical effect by their recommendation of the administration of calomel before that of a saline, led to a third idea.

Those familiar with the Meltzer-Lyon method of biliary drainage know how quickly and in what considerable amount bile may be made, in most cases, to siphon from the duodenum after the injection of magnesium sulphate solution, moot as the cause of such biliary flow may be. Thus were the possibilities afforded of administering without distress a chemical more or less nauseating to most people, which would serve the double purpose of markedly increasing the flow of bile and that of a quickly acting and powerful purge.

The passage of a duodenal tube in experienced hands is a matter of little if any inconvenience to the recipient. This method permitted the use of nauseating drugs without distress to the patient, the immediate and direct contact of an unchanged drug to the parasite, a quickly following deluge of bile, and a sweeping away by a strong saline of a stunned worm before sufficient recovery for reattachment.

CASE REPORT

Mrs. D., adult, white, female. History of no importance for present purpose, other than she had repeated unsuccessful attempts made to rid her of a tape worm.

October 21. Allowed to eat breakfast. Permitted to drink water at will, but denied noon and evening meal.

4:00 p. m. Instructed to take a choice of the more palatable effervescing salines, and four hours later a large simple enema.

October 22. Denied breakfast and reported at office at 9 a. m., at which time a duodenal tube was passed and left in situ during entire treatment. Bile recovered and two mils of fresh oleoresin of aspidium in 30 mils of quite warm water injected through the tube.

10:00 a. m. After a druggist sieve, 6 x 3 inches and sixteen mesh to the linear inch, had been placed in bottom of the office lavatory bowl, 100 mils of 33⅓ per cent warm magnesium sulphate solution was introduced through duodenal tube.

11:25 a. m. The patient passed into the sieve a twenty-two foot tape worm with head intact, the latter verified by microscopic examination. The tube was then removed.

12:00 Noon. The patient returned home in good spirits and no weaker than would be expected from a thirty-hour fast.

TREATMENT OF SEPSIS WITH MERCUROCHROME-220 SOLUBLE. A. V. St. George, New York (*Journal A. M. A.*, Dec. 26, 1925), reports five cases, in which mercurochrome was administered intravenously during life, whic hcame to necropsy in the chief medical examiner's department of the city of New York, and showed, among other anatomicopathologic changes, the lesions of mercurial poisoning. These five cases represent the first of a series that came under observation. Since these cases all showed strikingly similar lesions, both in the kidneys and in the colon, the chief medical examiner has performed postmortem examinations on all cases reported to his department in which mercurochrome has been used, with the result that he has accumulated a series of twelve cases, all of which showed evidence of renal and colon involvement. In the five cases presented, it is St. George's opinion that mercurochrome induced intense nephritic and intestinal lesions and thus contributed to death. Chemical analysis of all the viscera in these cases showed mercury in even larger amounts than were found in mercuric chlorid poisonings, a fact indicating the marked toxicity of this drug. From the meager cautioning literature, and the unfavorable cases that are everywhere discussed but not published, St. George says it is evident that the dangers of the drug have not been brought sufficiently to the fore. Locally, mercurochrome probably is a very good antiseptic; systemically, it may possibly be of value in selected cases when properly administered and controlled, though its indiscriminate use, for example, in such conditions as acute rheumatic fever or malaria, should not be countenanced.

NEW ADVERTISEMENTS

Attention is called to the advertisement of The Spokane Surgical Supply Co. (page 8) which presents a week of instruction in Electro-Physiotherapy by Dr. Noble M. Eberhart.

NORTHWEST MEDICINE
The Journal of the State Medical Associations of Oregon, Washington, Idaho and Montana
Devoted to the Interests of the Medical Profession of the Pacific Northwest

Editorial Office, 543 Stimson Building, Seattle, Wash.

JANUARY, 1926

EDITORIAL

OSTEITIS DEFORMANS

It is now fifty years since Paget first described osteitis deformans and as a result of his article and subsequent work the disease is now clinically well recognizable, though it probably is much more prevalent than published cases would indicate, for it is a disease which is discovered more or less accidentally in most cases. Attention is again directed toward osteitis deformans, osteitis fibrosa, and osteomalacia by Mr. R. Lawford Knaggs in his Hunterian Lecture* on osteitis deformans, in which he reviews the history of the disease both chronologically and clinically. The most interesting feature of his article is the statement that the three diseases mentioned which are closely allied in clinical manifestations are, in fact, closely allied etiologically. His statement is that, given an individual with marked idiosyncratic predisposition by bone which is nonresistant to the toxins producing the disease, it will appear in youth and early manhood as osteitis fibrosa with little bone reaction; in individuals with good vitality and natural resistance, but broken down by the influences of age or disease, the bone reaction will be fairly good and it will manifest itself as osteitis deformans; while individuals with severe depression of vitality by poverty, privation or rapidly repeated pregnancies will react to the toxins by developing osteomalacia with practically no bone reaction.

Knaggs regards the frequent development of bone sarcoma in osteitis deformans as a complication and not as a part of the disease, in contradistinction to German writers who regard it as part and parcel of the disease, though not always developing in every case. As it is customary to regard the Arab as an authority on the camel, an Englishman ought to be accepted as an authority on a disease found chiefly in British museums, but it does not seem that the frequency of bone sarcoma is altogether too great to regard it as an accidental complication; it simply must be part and parcel of the disease. Knaggs quotes Adami and McCrae† as authority for his statement that the process is not an inflammation but a metaplasia; and since it is not an inflammation he discards infection as the cause and accepts toxins of metabolic or intestinal origin as etiologic factors, though he can present no definite proofs. Indeed, he casts some doubt on his own statements by mentioning preceding trauma as prominently given as the cause by the patient in most clinical histories.

THE SEMICENTENNIAL OF THE GOOD SAMARITAN HOSPITAL

The fiftieth anniversary of The Good Samaritan Hospital of Portland was observed November 24 and 25, 1925, with appropriate ceremonies. Services began with celebration of the Holy Communion in the Bishop Morris Memorial Chapel, for the Trustees and Officers of the hospital, and was followed by breakfast. At luncheon the Board of Trustees were hosts to the medical staff, ninety-five of whom were present with only five vacant places. In the evening, at the nurses' home, a reception was given by the Trustees and Superintendent to graduate and student nurses and their friends. The second day luncheon was served for the clergy and representatives of the many donors to the hospital, at which Bishop Sumner presided and introduced the speakers: Dr. S. E. Josephi, Dr. Otis F. Akin, Mr. R. L. Glisan, Miss Emily Loveridge and Miss Evelyn Cathey. During the afternoons of both days open house was kept from three to five o'clock for the general public.

The Good Samaritan Hospital first opened its doors October 9, 1875, and the next day received the first patient. During the ensuing year, fifty-one patients entered the hospital. From this modest beginning it has grown until at present it has 319 beds, treats between eight and nine thousand patients each year, is equipped with every convenience and comfort and rates as first class according to the moderate standardization requirements.

On the religious side, the labors of Bishop Morris were preeminent. It was he who founded the institution and the work outlined by him has been zealously carried on by his successors. A number of clergymen have served faithfully as chaplains and many other clergymen have contributed, through their various parishes, to the upbuilding and success of the institution. In the history of The Good Samaritan Hospital, two women stand out as shining lights. Mrs. E. J. Wakeman came to the hospital in 1884 and served as superintendent until sixteen years ago. Miss Emily Loveridge was the first superintendent of the nurses' training school and succeeded Mrs. Wakeman as superintendent. She has been continuously on duty since 1890. Of the many doctors who have served the hospital, perhaps the most outstanding figures are those of Dr. S. E. Josephi and Dr. A. J. Giesy, whose services date back about the same length of time as those of Miss Loveridge, and whose keen interest in the welfare of the hospital has never flagged. They continue to be among the most active members of the staff. Space will not permit deserved eulogies of the host of others, clergy, physicians, nurses, donors and the general laity who, through their good will and kindly acts, have given freely of their time and service.

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* The British Journal of Surgery, Vol. XIII, No. 50, Oct., 1925, p. 206.

† Textbook of Pathology.

Fifty years ago St. Vincents Hospital also was born in Portland and the birth of these two institutions in the same year must have startled the small village that Portland then was, and may possibly have given some premonition of its future greatness. These institutions have kept pace with the growth of Portland to its present metropolitan proportions. But they represent infinitely more than steady, healthy growth of the city. They symbolize the close relation that exists between sound religion and healing. However physicians may regard religion, be their faith great or small, they cannot contemplate these two great institutions, with the multitude of others of their kind throughout the world, with other than a reverent and kindly attitude toward its achievement. Without the aid of religion there would be far fewer and far less efficient hospitals. Religious rivalry has frequently taken the beneficent form of a blessed competition in hospital construction but never for profit, other than that which was returned to better the institution by which it was created. Religion has, indeed, ofttimes made possible the payment of deficits, which are so many times more frequent than profit in hospital management. Physicians give unselfishly of their time and skill to hospital service and the care of the sick but no more so than priests or ministers who, with even less prospect of personal reward, have ever been active in relieving suffering and distress. And, when these two professions unite in good endeavor and erect and maintain such institutions as form the theme of these remarks, they justify their being, even though they accomplish nothing else.

THE LAST WORD IN MEDICAL LEGISLATION*

During recent years, when various medical cults have advocated fantastic methods of treating the sick, compliant legislators have legalized all forms of practitioners, so that they have equal standing before the public as practitioners of medicine, regardless of their knowledge of the medical sciences or the periods of time which they have devoted to study in preparation for practice. No state has been more liberal in these respects than Washington, where every imaginable form of practice is recognized and the latchstring is apparently hanging out for the reception of any others that may appear in the future, although unknown at present. The catastrophies and medical tragedies, frequently enacted at the hands of practitioners of the different cults, are due primarily to ignorance of the fundamental principles of treating human ailments.

At the recent session of the Washington legislature, an act was passed which should in the future have a regulating action and place a check to some extent on medical ignorance. This so-called Basic Science Act provides that all applicants for license to treat the sick must first pass an examination in anatomy, physiology, chemistry, pathology and hygiene. In order that the examination may not be prejudiced in favor of any group of applicants, it shall be conducted at the state university by members of the faculty teaching these branches. The natural inference is that, if a practitioner has made a thorough study of these fundamental branches, he is probably also versed in other departments relating to the treatment of disease. It is believed this procedure, if strictly carried out, will limit the mass of ignorant and uneducated practitioners who constitute a menace to the public health.

Credit for the final passage of this act through the legislature, as well as its successful encounters with many impediments and pitfalls, is due primarily to the leadership of Robert O. Jones, executive secretary of the Public Health League. Without his skillful judgment and discriminating thoughtfulness the measure would probably have fallen by the wayside. At the same time the actual results in each branch of the legislature were accomplished through the influence and the outstanding personalities of the group of splendid medical men who have served in the recent legislative session. It is predicted that this bit of legislation will probably become a precedent in medical legislation in other parts of the country.

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* After the above editorial was in type, the Governor vetoed this bill, though he had agreed to sign it, stating that political exigencies demanded such action. Later the Senate passed it over his veto but in the House it lacked three votes to secure the same result.

MEDICAL LAW ENFORCEMENT

An important medical measure, introduced toward the end of the Washington legislative session, will lead to a marked improvement in treatment of the sick and consequent benefit to general public health, if it is enacted into the law, the result of which is not known at this writing. It provides for a two dollar annual renewal license fee for medical practitioners, which is an equitable requirement, since the same is imposed upon all other forms of practitioners, as well as dentists and druggists. The act provides that the fees obtained from renewal licenses shall form a fund under the attorney general, which shall be employed for the strict enforcement of the various acts, under which all licentiates are legalized in the state. It is a well known fact that practitioners of certain sects, licensed to practice along certain distinct and specified lines, unhesitatingly overstep these restrictions and follow forms of practice in excess of their legal specifications, in which they have not had training or experience. The fund thus provided will be sufficient to employ legal talent, whose whole time will be devoted to the disclosure of violations of law of this nature and their subsequent prevention. As this act will solely be a measure for enforcement of laws on the statute books, one fails to observe what objections can be raised against its passage and subsequent execution.

(Near the close of the legislative session this bill passed both Senate and House and awaits the Governor's signature.)

ACADEMY OF MEDICINE LECTURES

The annual meeting of the Portland Academy of Medicine will be held Jan. 13. Dr. George Dick will deliver the Annual Lectures. Dr. E. S. Judd will present the Joyce Lectures in Surgery. The program will be as follows:

Wednesday, Jan. 13. 10:00 a.m. Clinic by Dr. Judd, Multnomah County Hospital.
8:00 p.m. Paper on Cholecystitis, by Dr. Judd, Woman's Club Bldg.

Thursday, Jan. 14. 10:00 a.m. Clinic by Dr. Judd, Multnomah County Hospital.
6:00 p.m. Dinner in honor of the guests, at Portland Hotel.
8:00 p.m. Paper on Scarlet Fever, by Dr. George Dick, at Woman's Club Bldg.

Friday, Jan. 15. 10:00 a.m. Clinic on Scarlet Fever Cases, by Dr. Dick. Place to be announced.
8:00 p.m. Paper on Scarlet Fever, by Dr. Dick, at Woman's Club Bldg.

MEDICAL NOTES

The Physicians Home. There are in the United States today over 140,000 physicians. It is said that at least 5 per cent of these are permanently incapacitated, many of whom after long lives of activity and usefulness become impoverished and are without friends to provide them the necessities of life. This situation so impressed certain physicians and philanthropists in the East that four years ago a venture was inaugurated, called The Physicians Home, Inc. They secured attractive land, containing a suitable residence in the hills of Caneada, New York. A certain number of aged, incapacitated physicians were placed in this home, where they all terminate their existence.

The institution has made such an appeal to physicians and other men of means, that it is proposed to enlarge the project and establish a national home which shall be called "Tranquility." Naturally, this will be nonsectarian and nonpolitical. The project has received the endorsement of national and state medical organizations, as well as the leading physicians and surgeons of the country. In order to finance the institution, an appeal is being made to those who appreciate the good that has been done by the lives and service represented by these physicians. The profession at large should become acquainted with a project of this nature, so that if any are disposed to offer their assistance they may be assured of its sincere appreciation. No one can foresee the exigencies and circumstances of old age. Who can predict that he himself may not in time become an applicant for services of this nature. The headquarters of the National Endowment Fund of the Physicians Home are in the Times Bldg., New York.

Congress on Internal Medicine. The Tenth Annual Congress on Internal Medicine will be held at Detroit and Ann Arbor, February 22-27. This is the largest and most important assembly of internists held on the western continent, being the only clinical week of internists available for practitioners. It will be devoted to amphitheatre, bedside and clinical laboratory demonstrations, as well as to symposia dealing with modern phases of internal medicine. All physicians interested in internal medicine are invited to attend the Congress.

A Passenger Hospital. There is being constructed at the Cramp shipyards, at Philadelphia, the largest and fastest passenger steamer ever built in the United States which will be placed on the run between San Francisco and Honolulu. An interesting feature is the passenger hospital, which will include two wards with accommodations for eight patients, with dispensary, operating room, etc. Another ward for the crew will accommodate six patients. The operating room will include all the usual equipment supplied by any up-to-date hospital. This is to be a novelty in steamship construction which will make an appeal to prospective travellers.

OREGON

Semicentenial Celebration. On Nov. 24 and 25 Good Samaritan Hospital, of Portland, celebrated its semicentenial. This is one of the oldest hospitals on the Pacific Coast, founded by the second bishop of the Episcopal diocese of Oregon, when it included Washington. The growth and development of this hospital, together with its training school for nurses, has been one of the outstanding features in hospital history of the Northwest. The continual growth of the hospital has been indicative of the progress of the city. Within the last ten years, additions and improvement have been provided at a cost of $450,000. A prominent figure in the institution has been Miss Emma Loveridge, who for more than twenty years has been superintendent of the hospital as well as the nurses' training school.

New Hospital Under Construction. A two story hospital building is being constructed for the Louise Home for Girls, on the Barker Road in the suburbs of Portland. The building is of brick, 50 by 150 feet, and will provide thirty beds beside operating rooms and administration equipment. It will cost $50,000, of which $20,000 has already been expended. A drive is being conducted in Multnomah county, outside of Portland. to raise the balance of $30,000.

Hospital Improved. St. Mary's Hospital, at Albany, has recently been modernized and thoroughly equipped for good work. It has a capacity for twenty-five patients. More space is demanded and new hospital construction is necessary. The institution is operated on a closed-staff plan.

Hospital to be Enlarged. The Community Hospital, at Medford, is to be enlarged by an addition which will increase its capacity to thirty beds. It is to be financed by the sale of $20,000 of stock to be sold to residents of the city.

Hospital to be Remodeled. The Pacific Christian Hospital, at Eugene, is being remodeled to provide more space to accommodate the increase of patients. The improvements will cost about $3000.

New Sanatorium Opened. A sanatorium and hotel at Hubbard Mineral Springs has been completed and opened to the public. The sanatorium and hotel were erected at a cost of $10,000. These springs have been called the "Carlsbad of America," because of their similarity to springs of that name in Germany.

Office and Surgery Building. It is reported that a four story building is to be erected at Morrison and Twelfth Streets, Portland, to occupy a quarter block. The top floor will be equipped for use of the Portland Medical Hospital Clinic. Garage space will be provided in the basement.

Nurses' Home to be Provided. County commissioners of Multnomah County will utilize $173,000, from the surplus of the interstate bridge fund, for an addition to the county jail and the building and equipment of a nurses' home in connection with the county hospital on Marquam Hill. At present the nurses are compelled to occupy quarters in the hospital that should be devoted to patients.

Superintendent of Hospital. Rev. J. D. Coan, formerly a minister of Medford, has been appointed superintendent and director of Wesley hospital at Marshfield. He has had previous experience in hospital work.

Demand for Full Time Health Officer. A movement has been started in Salem to abolish part time offices of city health officer, school physician and Marion county health officer, and to employ one full time health officer to be responsible for all matters pertaining to public health. The agitation resulted from dissatisfaction over divided responsibility, with consequent ineffective regulations of the public health situation. Such action will be in the line of the modern management of health conditions.

Elected to Important Office. At the annual meeting of Western Surgical Association, recently held at Wichita, Kansas, Dr. R. C. Coffey, of Portland, was elected president for the ensuing year.

Dr. R. C. Ward, who has recently practiced at Burns, has moved to Cascade, where he has located for future practice.

Dr. T. E. Griffith, who has resided for the past fourteen years at Dufur, has moved to The Dalles, where he will locate for practice.

Dr. C. G. Walker, who has lived for a number of years at Ione, has located for practice at Vale.

Dr. O. E. Patterson, who formerly practiced at Joseph, has located at Oak Ridge.

WASHINGTON

Course in X-rays and Radioactivity. Through its Extension Service, the University of Washington has begun a course of instruction in X-rays and Radioactivity for doctors and dentists, consisting of two sessions weekly. The purpose is to present the physical principles underlying these subjects.

New Hospital Under Construction. The Centralia General Hospital Association has awarded a contract for the construction of a new hospital, which will be built at a cost of $60,000. It will be three stories in height, 124 by 42 feet in size. It will contain forty beds and will be built according to modern principles for an up-to-date institution.

Medical Clinic Planned. It is proposed to reestablish in Yakima the public school medical clinic discontinued several years ago. Particular attention will be paid to eye, ear, nose and throat examination of children, whose parents have not the means to provide such attention. A dental clinic is already in operation in the schools.

Hot Springs to be developed. It is reported that a hotel and sanatorium are to be established at Starr hot springs, tributary to the Great Northern railroad, fourteen miles from Index. It is claimed that the waters possess radium emanations with other medicinal qualities, similar to those found in some of the European springs.

Hospital an Open Istitution. Valley Hospital, of Puyallup, previously known as the Puyallup Clinic, under supervision of a group of doctors, has been changed into a general hospital. It will be open for the reception of patients from all doctors.

Medical Building to be Constructed. It has been announced that plans have been made at Yakima for a medical and dental building to cost $250,000. The ambitious plan has been suggested of inducing every physician and dentist in the city to sign leases for space for a specified time. It will be erected on the corner of Yakima Avenue and Naches Street, on property purchased for that purpose.

Substitute Health Officer. Dr. O. J. Morehead, from Sanborn, Minn., has arrived for duty at Walla Walla, where he will serve as substitute county health officer during the absence of Dr. J. P. Kane. The latter is taking a six month's postgraduate course at Johns Hopkins University under a fellowship from Rockefeller Foundation. On his return, he will resume his work as full time county health officer.

Scarlet Fever Closes Schools. Last month the schools of Ritzville, and those in the county, were closed by orders of the city and county health officers on account of the prevalence of scarlet fever. A similar ban was placed on public gatherings attended by children under twelve years of age.

Smallpox Epidemic. From several sections of the state are reported increasing numbers of smallpox patients. At Wapato twenty-five cases were reported quarantined last month. Orders have been issued that no children shall attend school who have not been properly vaccinated. A number of cases are also reported in the Okanogan and Methow valleys, a number of deaths having occurred in these localities.

Dr. J. E. Cole, who has practiced for some time at Renton, has moved to Spokane, where he will continue practice.

Dr. G. W. Weddell, who has practiced for some time at Blaine, has moved to Seattle where he will practice in the future.

Dr. I. H. Moore, of Seattle, has returned after several months spent in Eastern hospitals and clinics in the study of rectal diseases.

Dr. P. J. Scallon, who practiced for a number of years at Tacoma, has located for practice at Duvall.

IDAHO

Fees to be Revised. A conference of insurance representatives, with the industrial accident board, was held at Boise, Dec. 2. One of the important subjects of discussion was the revision of the medical fee schedule which was adopted in 1919 and has been in force without alteration. It was recognized by all present that the schedule is antiquated and inequitable. A commission was appointed to study the subject of its revision.

Dr. O. M. Hustead, who has practiced for a short time at Toledo, Wash., has located for practice at Elk River. Beside engaging in general practice he will be surgeon for a logging firm.

Medical Wedding. Dr. O. C. Carssow, of Lewiston, was married to Miss Anna Eaves of that city December 15.

MONTANA

Annual Dues Should Be Paid Now. Members of the Medical Association of Montana are urged to pay their annual dues during this month of January. In consequence of the adoption of the group policy of insurance, it is of great importance that the annual dues be paid promptly at this time, in order to insure the safety and permanency of this plan.

Change of Meeting Place. At the last annual meeting of the Medical Association of Montana, it was voted to hold the meeting this year at Glacier National Park. Arrangements have been altered so that the meeting will be held at Billings, the date to be announced later.

Trachoma Among Indians. Dr. W. F. Cogswell, Secretary of the State Board of Health, recently spent some time on the Rocky Boy reservation with Dr. A. J. Collard of the Indian Service. Of 141 Indians examined 40 were found to have trachoma. Dr. Collard, for the Indian Service with the cooperation of Dr. Cogswell, has made a survey of trachoma among the Indians in Montana. It is estimated there are about 13,000 Indians in the state and Dr. Collard states that 25 per cent of them have trachoma. The Indian school children on the Blackfoot reservation are rapidly being cured by the radical operation. This was made possible by an exclusion order of the State Board of Health which kept out of school and confined to the reservation all trachomatous children, whose parents or guardians refused operation. Out of 54 cases among the school children, some 50 have had the radical cure.

Diphtheria and Osteopathy. At a trial last month at Helena, facts were provided showing that a child died from diphtheria under the attendance of an osteopath who refused to recognize the diagnosis. In the presence of positive laboratory examinations, she persisted in the diagnosis of noma. Although the parents were urged by physicians to administer antitoxin to the patient, with assurance that he would probably recover under this treatment, the osteopath treatment was followed with fatal results. Probably the chief result from this incident will be the wide-spread publicity of the criminal osteopathic attitude toward a disease which can be readily cured under accepted scientific treatment.

The Montana State Board of Health has recently issued new bulletins on diphtheria, anterior poliomyelitis and goiter. A scarlet fever bulletin is in press. These bulletins may be obtained, free of charge, by citizens of Montana upon request to the Secretary of the Board of Health.

President of State Conference Dr. Hazel D. Bonness, Director of the Child Welfare Division of the State Board of Health, was elected president of the Montana State Conference of Social Work at its annual meeting in Butte, Oct. 31. Dr. Bonness is also Chairman of May Day activities for 1926 in Montana and Mrs. Sara Morse, Secretary of the Montana Tuberculosis Association, has been named vice-chairman.

New Medical Adviser. Dr. R. M. Fouch, of

American Falls, has been appointed medical adviser of the state department of public welfare and director of public health service. This appointment was made by Gov. Moore and will fill the vacancy caused by the resignation of Dr. F. W. Almond, who retired to enter private practice in September.

Dr. W. A. Hulbush, who has practiced for seven years at Great Falls, has left for postgraduate study in the East, after which he will locate for practice at Bellingham, Wash.

Dr. R. C. Kirkwood, who has been for the past year connected with Park Hospital, at Livingston, has moved to Utah, where he will enter state tuberculosis work.

Dr. Steele, who has practiced for several years in Sheridan county, has located for practice at Plentywood, having lived for several years at Los Angeles, Calif.

Dr. R. B. Tracy, who has practiced neurology and psychiatry for a number of years at Butte, has moved to Seattle, where he has located for practice.

Dr. C. J. Sells, who has resided for some time at Plentywood, has removed to Longview, Wash., where he will resume practice.

OBITUARIES

Dr. T. W. Harris, of Eugene, Ore., died November 30, after a long illness. He was 76 years of age. He was born at Russellville, Ind., in 1849 and moved with his family in 1854 to Minnesota and later to Illinois. In 1865 the family crossed the plains with ox and horse teams to Portland, locating later at Albany. After attending local public school he spent a year at Christian College at Monmouth and then taught school for three years. In 1872 he graduated from Ohio Medical College at Cincinnati, locating for practice at Albany. In 1884 he again located in Eugene, where he practiced until his death. He took an active part in church work as well as civil affairs, being mayor of Eugene from 1899 to 1901. He was active in political affairs of his country. He was regarded as a most valuable citizen.

Dr. D. M. Ward, of Forest Grove, Ore., died in a Portland hospital, December 13, after a prolonged illness, at the age of 80. He was born at Albany, N. Y., in 1845. In childhood he moved to Ottumwa, Iowa. He was educated in the public school in that city and at College Hill academy in Cincinnati. After serving a short time in the Civil War he went to California and worked in San Francisco as a druggist. He obtained his medical education from Pacific Medical College in 1879. After practicing two years in Portland he settled in Forest Grove. For several years he served as U. S. Pension agent. In 1897 he joined the gold rush in Alaska and practiced in Dawson for a year, returning to Forest Grove where he continued practice.

Dr. N. C. Nelson, of Eugene, Ore., died November 28, after an illness of several months. He came to Eugene from Chicago in 1919 and was a member of the staff of the Northwestern and Pacific Christian Hospital. He also was identified with church and civic activities and was president of the Young Men's Christian Association of the city. He was particularly active in the work of boys' clubs and was a pioneer in developments of this character.

Dr. J. J. Welch, of Bellingham, Wash., died Nov. 22, after a month's illness. He was 86 years of age. He was born in Alabama in 1839. At twelve years of age he moved to Texas. When the Civil war broke out the family moved to Minnesota. He was a graduate of the University of Minnesota. In 1883 he moved to Ferndale, Wash. He was a pioneer practitioner and experienced the hardships of the early days of practice.

Dr. Sataro Sakami died Dec. 2 at Seattle, Wash. He was 39 years of age. He has been a resident of Seattle since coming from Japan twenty years ago.

Dr. L. C. McCabe, of Portland, Ore., died December 22, from disease of the heart. He was born at Arcola Ill. in 1863. He has practiced in Portland for the past sixteen years.

PUBLIC HEALTH LEAGUES

WASHINGTON

HEALTH VICTORY IN THE HOUSE

Olympia. (Special to Northwest Medicine.)—Marked by a song of hatred from Representative Burlingame of Walla Walla county, Senate Bill No. 123, the basic science measure, passed the House by a vote of 57 to 33. The Walla Walla legislator made a bitter attack on medical practitioners and referred to the bill presented by the health forces of Washington as "low down" and "cowardly." Quick, but courteous reply came from Mrs. Belle Reeves, of Wenatchee, who paid tribute to the work of scientific medicine and to the high character and training of the men who practice this profession.

Logan Long then came into the limelight by reading some confidential communications to physicians, sent out from the Public Health League offices. This speaker doubted the sincerity of the Washington Nurses' Association, which had given endorsement to this health project. Mrs. Maude Sweetman offered antagonistic comment on the bill and was assisted by Representative Shields of King County, who declared himself in favor of this measure during his campaign for election, but who was quick to forget this pledge when the bill came up for action.

Judson Falknor of King pointed out the necessity of raising standards of healing and urged the passage of the bill in the interest of health and human life. He was aided in his argument by Dent of Spokane, Glasgow of Stevens county, Lindsay of Clallam, Dean McLean of Pierce, Dr. Capron and others.

Efforts made to delay progress of the bill, through amendments and reference to other committees failed, and on roll call a lead of 24 votes was obtained for the measure. Having passed the Senate, where Drs. McCauley and Karshner led the fight for its passage, it was enrolled and sent over to the Governor's office for his action.

SANIPRACTORS FAIL

Sanipractic may have the virtues its leaders say it has so far as healing is concerned, but it failed to register any cures in the Washington legislature at this session. This cult offered opposition to the Basic Science Bill, which passed by comfortable majorities in the House and Senate. Then the lobby representatives of sanipractic offered House Bill No. 106, by Sweetman, which would have restored the licenses of those revoked last Spring for fraud, and at the same time would have enlarged the healing authority of the cult to a marked degree. This bill, having been adversely reported out in the House and lost in the Rules Committee of that body, was then presented in the Senate by Senators Harrison and Wray. It now rests comfortably in the Senate Committee on Medicine, Dentistry and Pure Drugs.

THOMPSON WOULD REGULATE MEDICAL PRACTICE

Now comes Representative George W. Thompson of Tacoma, an electrician, with two bills to regulate medical practice. Having been successful in electrical wiring, this legislator would try his skill at medicine. First he would open practically all of the hospitals of Washington to the cultist of any kind or description. Whenever anyone comes to the hospital and asks for a certain method of treatment, the superintendent must at once summon such practitioner and place all the facilities of the institutions at his disposal.

Then, Mr. Thompson, not having done his Latin, would have certain prescriptions in English. If a physician should decide that some narcotic drug or derivative thereof is needed for a certain case, he must immediately inform the patient and his treatment shall be determined by the decision of the patient. Undoubtedly this would mean in the final analysis a family referendum on medical treatment. Probably voting machines would be placed in all residences for quick and rapid voting whenever the doctor is called to care for a patient! However, it appears that not many members of the legislature are in agreement with Mr. Thompson's ideas, for his bills rest in the House Committee.

OREGON

OREGON PUBLIC HEALTH LEAGUE EMPLOYS SPECIAL INVESTIGATOR

C. A. Morrow of Seattle, Washington, with several years experience in law enforcement work, especially with the Bureau of Licenses of the state of Washington, is now in the employ of the Oregon Public Health League. He is investigating those who might be illegally practicing medicine and is checking up on illegal practitioners in chiropractics, osteopathy, chiropody, and cosmetic therapy. He is also gathering evidence for the Oregon Board of Pharmacy against those who are illegally practicing pharmacy.

The Oregon Public Health League office is now located in Room 315 Medical Arts Building, adjoining the State Board of Health, 304 Medical Arts Building. Dr. Frederick D. Stricker is the secretary of both organizations and the league meetings are held in the library room of the State Board of Health. Two league meetings are held each month on the first and third Mondays, respectively.

REPORTS OF SOCIETY MEETINGS

OREGON

CENTRAL WILLAMETTE MEDICAL SOCIETY

Pres., R. W. Hendershott; Secty., Geo. Vandervert

Central Willamette Medical Society held its annual meeting at Corvallis, Dec. 3, attended by sixty-five members and their wives. After the banquet a scientific meeting was held, at which Professor J. F. Brumbaugh, of the Oregon Agricultural College, gave an address on "The Mental Mill." Dr. K. H. Martzloff, of Portland, read a paper on "Variations in Malignancy of Different Types of Carcinoma of the Cervix," illustrated by lantern slides. There were piano and vocal selections from several ladies in attendance.

Resolutions of condolence were passed to the families of recent deceased members, Drs. N. C. Nelson and T. W. Harris, of Eugene.

The following officers were elected for the ensuing year: President, Dr. F. E. Beauchamp, Albany; vice president, Dr. W. W. Allen, Mills City; secretary-treasurer, Dr. G. E. Fortmiller, Albany; censor, Dr. E. C. Joseph, Corvallis.

COOS-CURRY COUNTIES MEDICAL SOCIETY

Pres., C. E. Dix; Secy., R. J. Dixon

A meeting of Coos-Curry Counties Medical Society was held at North Bend, December 8. The annual banquet of the society was held at North Bend hotel.

The following officers were elected for the ensuing year: President, Dr. A. B. Peacock; vice-president, Dr. G. E. Low, Coquille; secretary-treasurer, Dr. P. M. Drake, Coquille.

KLAMATH AND LAKE COUNTIES SOCIETY

Pres., H. D. Stewart; Sec'y, B. F. Rea

The annual meeting of Klamath and Lake Counties Medical Society was held at Klamath Falls, December 11. The following officers were elected for the ensuing year: President, Dr. D. L. Gass; Vice-President, Dr. J. G. Patterson; Secretary-Treasurer, B. J. Rea. Drs. Paul Sharp, of Klamath Falls and D. E. Everett, of Lakeview, were elected to membership.

A resolution was passed deploring the absence of suitable accommodations for isolating patients with infectious and contagious diseases, and urging the city council and county court to provide a suitable institution as early as possible.

LANE COUNTY MEDICAL SOCIETY

Pres., N. G. Nelson; Secy., L. S. Kent

A meeting of Lane County Medical Society was held in Eugene, December 17.

Dr. J. H. Fitzgibbon, Portland, read a paper on "Gastric Ulcer and Cancer of the Stomach." Dr. W. H. Dale, of Eugene, read a paper on "Treatment of Cancer by Surgery and Radium." There was a general discussion of both papers.

The following officers were elected for the ensuing year: President, Dr. E. L. Zimmerman; vice-president, Dr. Merl Howard; secretary, Dr. L. S. Kent; treasurer, Dr. R. H. Field, all of Eugene.

POLK-YAMHILL-MARION COUNTIES SOCIETY

Pres., E. E. Fisher; Secy., D. R. Ross

A meeting of Polk-Yamhill-Marion County Medical Society was held December 16 at Salem. There was an attendance of thirty-one members.

Dr. W. B. Holden, of Portland, read a paper on "Surgical Menaces." Dr. J. H. Fitzgibbon, Portland, read a paper on "Lesions of the Esophagus," illustrated by lantern slides.

PORTLAND CITY AND COUNTY MEDICAL SOCIETY

Pres., H. C. Bean; Secty., K. H. Martzloff

A regular meeting of the Portland City and County Medical Society was held at the Portland Hotel, Portland, Ore., Dec. 2. 1925, President Bean in the chair. Minutes of the previous meeting were read and approved.

The following applications for membership were presented, the same having been approved by the board of censors: H. N. Steelhammer, F. E. Boyden, and A. H. Johnson.

PROGRAM

The first paper was by Dr. Louis Wolf entitled, "Obstetrics Among the Eskimos," with a report of cases observed while with the Peary Arctic Explorations. The paper was most interesting and replete with descriptions and observations entirely strange to us in our moderate climatic surroundings.

The second paper was by Dr. Otis Wight, entitled, "The Early Recognition of Cancer." He emphasized the importance of recognizing cancer where it exists and, of equal importance, knowing when it does not exist. The paper was discussed by Drs. Tucker, Watkins, Else and Baird.

The third paper was by Dr. Walter Anderson of the United States Navy on his observations from the examination of six thousand applicants for the navy and marine corps from the Pacific Northwest. The paper was discussed by Drs. C. U. Moore and Amos.

Portland City and County Medical Society held its annual meeting at the Benson Hotel, Portland, Ore., December 16, with a large attendance from members and friends.

Among the speakers of the evening was Dr. Edward H. Pence, of Westminster Presbyterian Church, who took the society to task for not having exerted themselves to aid in the prevention of "healing" meetings conducted by the Rev. Price. The periodical attack on the medical profession as being responsible for the farce of expert medical testimony was presented by C. R. Peck, counsel of the Portland Electric Power Company.

An interesting feature of the meeting was the presentation of cartoons of prominent members of the society, drawn by Reynolds of the Oregonian and exhibited at the annual meeting eleven years ago.

The following officers were elected for the ensuing year: President, Dr. T. H. Coffen; Vice-President, Dr. Roy Stearns; Secretary, Dr. K. H. Martzloff.

WASHINGTON

CHELAN COUNTY MEDICAL SOCIETY

Pres., R. S. Mitchell; Secty., Henry Baer

Chelan County Medical Society held its annual meeting at Wenatchee, Dec. 3, with twelve of the thirty members in attendance.

The program consisted of papers by Drs. G. W. Swift and C. W. Sharples, of Seattle.

The following officers were elected for the ensuing year: President, Dr. E. J. Widby, Wenatchee; vice president, Dr. E. Hayden, Cashmere; secretary-treasurer, Dr. Henry Baer, Wenatchee; board of censors, Dr. E. D. Sawyer and Dr. T. H. Grosvenor, Wenatchee, and Dr. Chas. Conway, Cashmere. Dr. R. S. Mitchell, of Wenatchee, was elected delegate to the meeting of the state association.

KING COUNTY MEDICAL SOCIETY

Pres., A. C. Crookall; Sect'y, C. E. Watts.

A general meeting of King County Medical Society was held at Seattle, December 7, with President Crookall in the chair. There were 106 members present. Minutes of the previous meeting were read and approved.

The following applications for membership were presented: Drs. Victor Cefalu, C. L. Smith, C. A. Regan, W. A. Glasgow, K. H. Beckey, S. Sawamura, K. G. Burns, Paal Torland and A. G. Friend.

PROGRAM

Dr. G. E. Pfeiffer, chief of surgical staff U. S. Veterans' Hospital Cushman, Tacoma, read a paper on "Surgical Activities in a Veterans' Hospital." He described the nature of work carried on in the hospital, particularly during the past year. The paper was discussed by Drs. H. D. Dudley, H. E. Allen, A. O. Loe, F. S. Wiltsie.

Dr. Dorrell Dickerson, neuropsychiatrist, U. S. Veterans' Hospital, American Lake, read a paper on "Neuropsychological Studies in Psychotic Cases." (See page —.) The paper was discussed by Dr. G. W. Swift.

Dr. A. C. Feaman, chief of tuberculosis section, Seattle regional office, read a paper on "Tuberculosis—Activities in U. S. Bureau Regional Office." He described the essential factors in diagnosis and detailed methods of treatment in the Veterans' Bureau. The paper was discussed by Drs. C. R. Castlen, A. D. Tollefsen, Frank, and Frederick Slyfield.

Dr. A. O. Loe made an announcement regarding the "Basic Science Bill" before the legislature.

Dr. D. C. Hall made an appeal for the support of the Public Health League.

It was voted to send telegrams to each member of the legislature urging the support of the "Basic Science Bill."

PIERCE COUNTY MEDICAL SOCIETY

Pres., W. B. McCreery; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in its rooms at Tacoma, Dec. 8. Dr. McCreery in the chair. Minutes of the previous meeting read and approved.

PROGRAM

"A Review of Thirty-four Cases of Perforated Gastric and Duodenal Ulcers, Illustrated with Lantern Slides," Dr. H. G. Willard. This paper was discussed by Drs. Dodds, Nelson, Crowe, Engels and Steagall.

Dr. Engels reported on publicity leaflet in regard to epidemics of diphtheria and smallpox. He recommended that 5,000 of these leaflets be ordered and given to the physicians to be mailed with their monthly statements. After some discussion, motion was made and seconded that a committee of three be appointed, with power to act in regard to this matter. Motion carried. Drs. Engels, Dayton and Layton appointed on the committee by the president.

On ballot, Dr. J. W. Gullikson was elected a member of the society. John Roswalt, Captain, located at Station Hospital, Camp Lewis; L. E. Beringer, Captain, Station Hospital, Camp Lewis; and C. R. Byars, Major, Station Hospital, Camp Lewis, were accepted as members of the society.

Proposed changes in by-laws relating to increase of dues were read. Discussion by Drs. Engels, Penney, Quevli, Dayton, Willard and Dodds favored the raising of the dues.

Dr. Willard made a report of the committee appointed to bring in recommendations in regard to advertising. The committee recommended the following changes in the constitution: Under Article 6, all of Article 6 shall be eliminated, except "The code of the American Medical Association shall be the code of this society."

The following nominations for officers for 1926 were made: President, D. H. Bell, E. F. Dodds, W. B. Penney; Secretary-Treasurer, J. A. Locke, W. B. Penney; Vice-President, D. M. Dayton, T. B. Murphy, J. F. Steele; Trustees for two-year term, C. R. McCreery, J. R. Brown, C. F. Engels, T. R. Steagall, A. E. Bridge, G. M. Steele, J. F. Griggs, W. D. Read, C. Quevli, E. A. Layton; Delegates to the State Association, W. D. Read, B. A. Brown, G. F. Skinner, H. G. Willard, J. F. Steele, W. B. Penney; Alternates, T. B. Murphy, M. T. Nelson and E. F. Carlsen.

New Officers Elected. Pierce County Medical Society held its annual meeting at Tacoma, December 22. The following officers were elected for the ensuing year: President, Dr. E. F. Dodds; vice president, Dr. D. M. Dayton; secretary-treasurer, Dr. W. B. Penny; trustees, Drs. W. B. McCreery, J. F. Griggs and W. B. Read. Delegates to state association meeting, Drs. H. G. Willard and W. B. Penny. Alternates, Drs. T. B. Murray and E. L. Carlson.

SKAGIT COUNTY MEDICAL SOCIETY

Pres., R. M. McKinley; Secy., S. W. Holton

Skagit County Medical Society held its quarterly meeting at Sedro-Woolley, December 18, with fifteen doctors in attendance. Dr. C. E. Hagyard, of Seattle, gave an address on "Colitis." Dr. W. O. Bell, of Seattle, presented a paper on "Endocervitis." A general discussion followed the reading of the papers.

SNOHOMISH COUNTY MEDICAL SOCIETY

Pres., O. A. Tholme; Secty., A. P. Duryll

The annual meeting of the Snohomish County Medical Society was held at Everett, at the Golf and Country Club, Dec. 1. Besides members of the society in attendance, were also the presidents of King, Whatcom and Skagit county societies.

At the banquet, which was also ladies' night, Dr. J. B. Eagleson, of Seattle, delivered an address.

IDAHO

POCATELLO MEDICAL SOCIETY

Pres., W. W. Brothers; Sec'y, H. H. Hughart

A meeting of Pocatello Medical Society was held at Pocatello, Ida., Dec. 11.

The program consisted of a discussion made by Dr. R. C. Ray on "Whole Wheat Bread for Children."

The following officers were elected for the ensuing year: President, Dr. C. V. Groom; Vice-President, Dr. F. M. Sprague; Secretary, Dr. H. H. Hughart. Dr. J. R. Young was elected delegate to the next meeting of the state medical association.

MONTANA

EASTERN MONTANA MEDICAL SOCIETY

The quarterly meeting of Eastern Montana Medical Society was held at Forsyth, December 18, with an attendance of sixteen, representing seven cities and towns.

After a dinner Dr. H. J. Bridenbaugh, of Billings, read a paper on x-ray therapy. Dr. M. C. Pfunder, of Miles City, also read a paper.

FERGUS COUNTY MEDICAL SOCIETY

Pres., A. C. Biddle; Secty., E. A. Weldon

A meeting of Fergus County Medical Society was held at Lewistown Dec. 1, with attendance of physicians from several cities in that locality.

Drs. Wallin, Deal, Parsons and Welden gave reports on clinic and postgraduate visits to various Eastern points within the past few months.

SILVER BOW COUNTY MEDICAL SOCIETY

Pres., H. F. Carman; Sec'y, Alfred Karsted

A meeting of Silver Bow County Medical Society was held at Anaconda, Mont., December 10.

The following officers were elected for the ensuing year: President, Dr. J. B. Frisbee; Vice-President, Dr. E. S. McMahon; Secretary, Dr. Alfred Karsted; Treasurer, Dr. Harold Schwartz.

Furuncle of the Nose. Thomas J. Harris, New York (*Journal A. M. A.*, Dec. 19, 1925), reports a case of furuncle of the nose resulting in septicemia, which was treated successfully by injections of mercurochrome. This case is instructive on a number of accounts. First, because of the etiology—an innocent appearing pimple in the nose of a healthy young girl following an incision on the third day gave rise to a swelling which extended to the cheek and eye, accompanied by high fever. There were numerous foci of suppuration with staphylococcus infection of the blood, septic pneumonia and endocarditis, with recovery at the end of two months.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

A Text-Book of Medical Diagnosis. By James M. Anders, M. D., Professor of Medicine, Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, and L. Napoleon Boston, M. D., Associate Professor of Medicine, Graduate School of Medicine, University of Pennsylvania. Third Edition, Entirely Reset. Octavo of 1422 pages, 555 illustrations, some in colors. Philadelphia and London: W. B. Saunders Company, 1925. Cloth, $12.00 net.

In the third edition of this well known and excellent treatise on medical diagnosis the various diseases are discussed separately and in much the same order as in works on the practice of medicine. The text is, however, devoted wholly to diagnosis and differential diagnosis. In the march of time our ideas have changed and the text has not wholly changed with them in some instances. Thus, under pernicious anemia, a good deal of space is given to the blood changes and, in a table showing its differentiation from gastric cancer, we find, under pernicious anemia, "Examination of gastric contents after test meal negative," while under gastric carcinoma we read, "Absence of free HCL and presence of lactic acid." Of the most important symptoms of pernicious anemia, the absence of free HCL, numbness and tingling of the feet and hands, and sore mouth and tongue, no mention is made except under nervous phenomena, i. e., "parasthesia, twitchings, spastic paralysis of the limbs, and abnormal reflexes of the lower extremities, with a possible absence of the knee jerks." It is much easier to make a positive diagnosis of pernicious anemia with the presence of a lemon pallor, profound weakness and the above symptoms, than on the most perfect examination of the blood.

Again, there seems to be no description of chronic cholecystitis in the book except that under the head of cholelithiasis. As cholecystitis is by far the most common of all disorders of digestion, this seems a misfortune. The most accurate and reliable method of diagnosis, that of Graham and Cole, is not referred to but perhaps its origin is too recent. The use of the stethoscope to elicit gallstone crepitus, while compressing the gallbladder, is recommended and perhaps deserves to be tried more commonly. Tender spots between the ribs in various places on the anterior and lateral aspects of the lower right chest are noted as characteristic of gallbladder disease. An even more characteristic tender area is that often found in the right back under the angle of the scapula, it has seemed to the reviewer.

Under the head of liver function the test of Piersol and Bockus is described which necessitates the recovering of the dye given intravenously with a duodenal tube. The chief tests of importance, the van den Bergh and Rosenthal, are not discussed. The van den Bergh test appears to be most generally useful in determining the amount of bilirubin in the blood serum, and whether it and the jaundice are of hematogenous or obstructive origin. The liver may be greatly diseased and still give a normal function with the dye, in the writer's experience.

There is an elaborate and comprehensive section on chronic interstitial nephritis, but in no part of it is the blood pressure mentioned. Under the head of palpation, in this section, it is stated "that the arterial tension is increased, the pulse small and wiry," but nowhere is taking the blood pressure advised, nor is arterial tension or blood pressure spoken of in the summary of diagnosis of interstitial nephritis. These criticisms are not intended in an unkindly spirit, or as evidence that this book is unworthy. On the contrary, in a large work of 1422 pages which has been revised twice, it is easy to overlook matters that should be rewritten and, because the greater part of the work is of such high excellence, it is unfortunate that any flaws can be discovered in it.

The reviewer once called attention of Osler to eight instances in his unsurpassed textbook, where statements occurred in different parts of the work which were absolutely conflicting. He wrote a very gracious and grateful reply, in which he said he could not recollect in the many revisions what he had said in previous ones and in connection with related subjects in various parts of his book.

In the present work, under posterolateral sclerosis, there is an admirable description of the nervous symptoms in pernicious anemia, but this is not to be found under pernicious anemia. As a whole, the work is a valuable contribution to the subject of medical diagnosis, as the eminence of its authors would foretoken.

Winslow

Radiography. A Manual of X-Ray Technic, Interpretation and Therapy. By Charles B. Enfield, M. D., F. A. C. P. Roentgenologist to St. Anthony's Hospital and Norton Memorial Infirmary, Louisville, Ky. 290 pp., $10.00. P. Blakiston's Son & Co., Philadelphia, 1925.

The author says: "A good many years ago, when the writer first became interested in x-ray problems, he experienced a rather surprising difficulty in getting the sort of information and advice he required. Roentgenologists as a rule did not seem to be interested in the simpler technical problems nor in the interpretation of evidence of the commoner lesions: naturally enough, since these were things which 'everybody' knew about and in which 'nobody' was much interested. A very considerable number of medical men, not roentgenologists, are finding it worth while and necessary to do some, or all of their x-ray work. This little book has been written for men so situated."

The author gives the novice in x-ray work, or one who is planning on installing an x-ray laboratory, very good advice in regard to the type of equipment to be purchased, outlines in a simple fashion the fundamental principles of x-ray, the more recent appliances used in this specialty, and lays down a simple technic for different parts of the body which are to be x-rayed. He takes up the different conditions in which the x-ray is of assistance in making a diagnosis, and explains them in such a manner that the beginner can grasp them. He mentions briefly the newer technics which are used by experienced roentgenologists, not going into detail on account of not wanting to confuse the beginner. A short chapter on x-ray therapy concludes the book. This volume should be of great value to the general practitioner or to the specialist who is putting in a moderate amount of x-ray equipment to take care of his own practice. No book on the market fulfills the purpose of this one, and it is highly recommended by the reviewer.

BAUMGARTEN

CLINICAL LABORATORY MEDICINE. A Textbook of Clinical Laboratory Diagnostic and Therapeutic Procedures. By Henry M. Feinblatt, M. D., Director of Laboratory, United Israel-Zion Hospital, etc., Brooklyn, N. Y., and Arnold H. Eggerth, A. B., A. M., Associate Professor of Bacteriology, Long Island College Hospital. Illustrated by two colored plates and 87 engravings. 424 pp. $5. William Wood & Co., New York, 1925.

The number of text-books upon clinical laboratory medicine is legion, and much of the technic has been so well standardized that it is merely left to the different authors to state the same things in different words. It is in the newer tests and the selection of likely material from the numerous procedures proposed in different articles appearing in the journals, that there is the real chance for usefulness and distinction. The newer things must also be periodically summed up and incorporated in the standard texts, so that the issuance of new books on a subject from time to time is a necessity, and it matters not so much whether the first author to include them is good or bad.

While this volume cannot be said to fill a crying need, the authors have gotten up a good, understandable text, efficient in arrangement and pleasing in style. The subject matters are presented in short, pertinent chapters, each under its individual heading and without confusion. The authors are to be commended for emphasizing that laboratory work must always be taken in conjunction with the clinical picture, and not considered so much an exact science. Too greatly has the clinician come to expect of the laboratory a report in terms of either "yes" or "no," expecting to be himself merely the mouthpiece to echo the answer to the patient and to institute treatment. The newer tests, the Schick test and Dick test, and the corresponding immunizing processes are presented in a clear and concise way that is highly praiseworthy. The manner is such that one reading of these matters for the first time from this text would have a clear understanding of them upon completion of the chapters.

CEFALU.

THE THERAPY OF PUERPERAL FEVER. By Privatdozent Dr. Robert Koehler, formerly assistant of the Gynecological Department of the Krankenhans Wieden in Vienna. American Edition. Prepared by Dr. Hugo Ehrenfest, M. D., F. A. C. S. Associate in Obstetries, Washington University School of Medicine, St. Louis, etc. with 27 illustrations, 276 pages. $4.00, C. V. Mosby Co., St. Louis, 1925.

The treatment of systemic infections by means of antiseptic solutions directly infused into the blood stream, chemotheropy and, most important of all, non-specific protein therapy, all very recent additions to our therapeutic armamentarium, have been introduced into the treatment of puerperal infections. Koehler is well fitted to analyze judiciously the innumerable therapeutic suggestions that have been made of late, often apparently not of ultimate benefit to the patient. This volume reflects the rational and impartial judgment of an experienced obstetrician. Those interested in this subject will find many new suggestions for the treatment of this baffling complication of pregnancy.

C. D. SHANNON.

DISEASES OF INFANTS AND CHILDREN. By Henry Dwight Chapin, A. M., M. D. Ementus Professor of Medicine (Diseases of Children) at the New York Postgraduate Medical School and Hospital, etc., and Lawrence Thomas Royster, M. D. Professor of Pediatrics and Head of the Pediatric Department of the University of Virginia. Fifth Revised Edition. 633 pages, $6.00. William Wood & Co., New York. 1925.

The fifth edition is an up to date discussion of the more common disorders of infancy and childhood. It is brief, to the point and very readable. Recent advances in knowledge of scarlet fever and other communicable diseases have required much revision and the addition of new material. The text is illumined by illustrations, many of them in colors, which add to information of the volume. These qualities make it one of the most valuable textbooks for the student and a handy reference work for the busy general practitioner.

C. L. SMITH.

MANUAL OF OBSTETRICS. By John Cooke Hirst, M. D., Associate in Gynecology and Obstetrics Graduate School of Medicine, University of Pennsylvania; Associate in Obstetrics, School of Medicine, University of Pennsylvania. Second Edition, entirely reset. 12 mo. of 551 pages with 229 illustrations. Philadelphia and London: W. B. Saunders Company, 1924. Cloth, $4.50 net.

Considerable new matter has been added to this edition, notably the sugar tests for early pregnancy, Rubin test for artificial pnuemoperitoneum to establish patency or closure of the tubes in sterility; glucose injections in the toxemias of pregnancy, the detailed technic of Potter's podalic version; technic of Cesarian section, the Kielland forceps in occipitoposterior positions, the newer methods of attempted disinfection of the blood stream in puerperal sepsis, puerperal psychoses, the test of liver function in toxemias, placenta accreta, anesthesia in obstetrics and many other additions, where new facts or methods claim proper attention. There is no doubt that this handy volume will be found valuable by the practioner, whose time for voluminous reading is limited.

C. D. SHANNON.

DIABETES. ITS TREATMENT BY INSULIN AND DIET. A handbook for the patient. By Orlando H. Petty, A. M., M. D., F. A. C. P. Professor of Diseases of Metabotism, Graduate School of Medicine, University of Pennsylvania, etc., and William H. Stoner, A. M., M. D., F. A. C. P. Associate Professor of Brochemistry, Graduate School of Medicine, University of Pennsylvania. With illustrations and tables. 133 pages, $1.50. F. A. Davis Co., Philadelphia, 1925.

This little book is a valuable contribution to the literature on diabetes mellitus. The ultimate problem in caring for diabetes patients is to educate these individuals how to care for themselves. The authors have gathered together the salient facts necessary for successful home management, and they are so presented that they are readily understood and easily followed. The mentioning of outstanding individuals who have made contributions to the better understanding and treatment of diabetes is apt to lead to difficulty, and one wishes as he reads this text that the sharp lines of contrast in this respect were not quite so obvious.

HOFRICHTER.

MASSAGE AND THERAPEUTIC EXERCISE. By Mary McMillan, Supervisor of Aids in Physiotherapy, Medical Corps, U. S. A., 1919-20. Second Edition, Reset 12 mo. of 331 pages with 17 illustrations. Philadelphia and London; W. B. Saunders Company, 1925. Cloth, $2.50 net.

The experiences learned from the World War emphasized the value of physical measures for the relief of some bodily ailments. The benefits of massage and various therapeutic exercises was clearly demonstrated in the treatment of disabled soldiers. This volume is divided into two parts, the first dealing with massage. Different forms of its application are described, general principles being first discussed, with statements of the objects to be gained by it. Separate chapters are devoted to the treatment of individual diseases, the application of massage being described in detail with each. Part II treats of therapeutic exercises. The author discusses the objects to be gained by its use and the methods of application. There are a number of general conditions and specific diseases which may be remedied by properly controlled exercises. One notes that asthma and cardiovascular disturbances are among those which may be improved by judicious exercises. One will find much of interest and value in this volume.

PHYSIOTHERAPY, THEORY AND CLINICAL APPLICATION. By Harry Eaton Stewart, M. D., President-Elect American Academy of Psyiotherapy, etc. 351 pp. $7.50. Paul B. Hoeber, Inc., New York. 1925.

Interest in physiotherapy has become so general that a book of this character is welcome, containing detailed descriptions of principles and therapy. Part I is devoted to theory, explaining the principles of all the modalities employed in this sort of treatment. A chapter is devoted to each method of procedure, from which one can obtain a clear conception of the methods of application. Part II deals with clinical applications, in which different diseases are listed whose relief is amenable to one or more physiotherapy measures. This volume can be commended to all who are seeking information in the realm of physical therapy.

THE ART AND PRACTICE OF MEDICAL WRITING. By George H. Simmons, M. D., Editor and General Manager Emeritus, American Medical Association, and Morris Fishbein, M. D., Editor, The Journal of the American Medical Association. 163 pp. Press of the American Medical Association. Chicago. 1925.

A book on the writing of medical papers from men of such wide experience as the authors of this volume is a guarantee of authority on this subject. This little volume is packed so full of useful information for the correct writing of a medical paper, that it is difficult to select suggestions of special importance. Any writer would do well to scan the chapter dealing with style. One might think it superfluous to warn one against verbosity, poor grammar and slang, yet every editor is often obliged to correct errors of these sorts in papers submitted for publication. Chapters are devoted to such elementary topics as words, spelling, capitalization, abbreviations, etc., all of which are important and necessary to the majority of medical writers. A useful chapter is that dealing with bibliography. If every writer observed the principles herein suggested, it would add to the benefit of his paper and relieve the editor's labors. This volume can be highly commended to every writer of medical papers.

INSECTS AND DISEASES OF MAN. By Carroll Fox, M.D., Surgeon U. S. Public Health Service, etc. 92 illustrations. 349 pages, $4.00. P. Blakiston's Son & Co., Philadelphia. 1925.

This volume presents necessary information for the student of entomology, and the health officer working with preventable diseases transmitted by anthropods. Part I presents the classification, identification, anatomy, life history, general considerations, etc., of the insects under consideration, with a chapter on arachnida and rodent. Part II deals with diseases transmitted to human beings by anthropods. Under each disease is discussed the causative agent, source of infection, mode of transmission, period of incubation, communicability and other essential details. Space is also devoted to the treatment of carriers, prophylaxis and many other practical details connected with elimination of this form of diseases. It is a practical and useful publication.

MEDICAL AND SURGICAL REPORT OF ROOSEVELT HOSPITAL, NEW YORK. 378 pages, $5.00. Paul B. Hoeber, Inc., New York City. 1925.

This report comprises a second series, based on work in this hospital during the years 1915-1924. The medical and surgical staffs comprise leading men of the metropolitan profession. Many interesting and instructive reports are presented of surgical conditions and medical cases, which may come under the observation of all busy practitioners. Much information is obtainable from the consideration of the experiences of these prominent members of the profession.

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PSYCHOLOGICAL HEALING. An Historical and Clinical Study. By Pierre Janet, Member of the Institute and Professor of Psychology at the College of France. Translated by Eden and Cedar Paul. 2 vols. The Macmillan Co., New York, 1925.

It is hardly necessary to say anything introducing Janet. His work along psychological lines and his treatment of neurosis have been well known for years. In these volumes he covers practically every phase of psychological healing. The work is divided into four parts, of which the first two are devoted mainly to the sources of the various psychotherapeutics and an investigation into their theories and practices; a valuable contribution to historical medicine. Under chapter headings, "Miraculous Healing," "Philosophical Methods of Treatment," and "Medical Moralization," he deals ably and entertainingly with the different cults, showing the natural causes of cures where such have taken place under these treatments.

Part Two covers the history of suggestion and hypnotism, giving results of treatment. Parts Three and Four are devoted to the late forms of treatment, the former including the treatment by rest, isolation and "mental liquidation," the latter, which makes up the entire second volume, taking up psychological treatment under the three chief divisions—education, excitation and guidance. Back of this work are years of preparation, wide experience and painstaking study, and we have the result in this splendid publication. WILT.

INTRAVENOUS THERAPY. Its Application in the Modern Practice of Medicine. By Walton Forest Dutton, M.D. Formerly Medical Director, Polyclinic and Medico-Chirurgical Hospitals Graduate School of Medicine, University of Pennsylvania, etc. Illustrated with 64 halftones and line engravings, some in colors. Second Revised and Enlarged Edition. 594 pp. $6.00. Philadelphia. F. A. Davis Company, Publishers. 1925.

This volume is a concise treatise on intravenous therapy, which is finding an ever increasing field. Part I covers all phases of general technic in an adequate manner, describing the different methods in common use, supplemented by enlightening illustrations. A chapter on arsphenamin and allied arsenicals contains much information that everyone should know who employs these drugs.

Part II discusses the subject of intravenous medication and its bearing on many phases of its relation to the human body. More than half of the book is devoted to consideration of the many diseases, susceptible to intravenous therapy, with detailed instructions for treatment in each disease. A list of references is given after each disease, presenting authorities for all statements. This volume offers material which will be invaluable to anyone employing intravenous therapy.

SPEIDEL.

PRINCIPLES OF SURGERY FOR NURSES. By M. S. Woolf, M. A., B. Sc., M. R. C. S. (Eng.), L. R. C. P. (London), Instructor in Surgery, University of California Hospital, San Francisco. 12 mo. of 350 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1925. Cloth, $3.00 net.

This volume is not a textbook of surgery. It presents the essential facts of surgical principles, the knowledge of which is necessary for the practice of an efficient nurse. Each chapter deals with a special surgical subject, in which the basic principles are set forth and at its end is a summary of the facts under discussion. A thorough study of this volume will add greatly to the nurse's efficiency.

SIMPLIFIED NURSING. By Florence Dakin, R. N., Inspector of Schools of Nursing, State of New Jersey. Illustrated. 499 pages, $3.00. J. Lippincott Company, Philadelphia and London.

The purpose of this book is to provide the nurse with the essential principles for doing the work of her profession. The book comprises three chapters on routine work, general nursing methods and special nursing methods. Each chapter contains a series of lessons, each of which follows the general plan of definition, explanation and instruction. Where necessary, there are additional paragraphs under caution, safe-guard and note. This system of presentation gives a concise and adequate discussion of each subject considered. It offers a useful and satisfactory treatise on the general subject of nursing.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume IX, Number 3, New York Number, November, 1925. Octavo of 312 pages, with 72 illustrations. Per clinic year, (July 1925 to May 1926) paper, $12.00; cloth, $1.00 net. Philadelphia and London; W. B. Saunders Company.

This number contains clinics from well-known New York internists on many important conditions of disease. Miller discusses at length sclerosis of the pulmonary artery and its branches, a disease which he says is a fairly well defined clinical condition, reported by many observers and corroborated at autopsy. Facts as to etiology and diagnosis are fully presented. Held and Gray discuss the present status of x-ray diagnosis of gastric and duodenal ulcer. The latest facts of these important conditions are presented, with a bibliography which is up to date. Other equally valuable discussions are included.

BIRTH INJURIES REQUIRING ORTHOPEDIC TREATMENTS. Samuel W. Boorstein, New York (*Journal A. M. A.*, Dec. 12, 1925), points out that many permanent injuries are traced to parturitional trauma. Many of these injuries can be diagnosed at birth if careful examination is made. The obstetrician or the general practitioner should acquaint himself with the proper methods of prompt diagnosis so that early treatment can be instituted where necessary. If he himself cannot diagnose the case, he should consult the orthopedic surgeon. The spastic cases should be treated at once even when we are in doubt whether the mental condition of the child will ever be normal. One cannot foretell how much mental recovery will be obtained. The armamentarium of the obstetric service in the hospital should include the braces or wire splints necessary for immediate attention in these cases. Cases of intracranial injury are treated by a double Thomas abduction frame with arm attachments.

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The Journal of the State Medical Associations of Oregon, Washington, Idaho, Montana
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ORIGINAL CONTRIBUTIONS

THE IMPORTANCE OF A ROUTINE WASSERMANN TEST IN PRIVATE PRACTICE*

Reginald Fitz, M.D.

BOSTON, MASS.

From the Medical Clinic of the Peter Bent Brigham Hospital

INTRODUCTION

The Wassermann test is more generally utilized than any of the various laboratory tests which have been developed for diagnostic work during the last twenty years. Its originator, Professor August von Wassermann, died in Berlin on March 16 of this year. We must never forget the great service which he has performed for our profession in devising an accurate means for the diagnosis of syphilis. The clinical and practical importance of his test is a timely subject to bring before a gathering of physicians engaged in general practice.

In the *Deutsche Medizinische Wochenschrift* for May 10, 1906, there appeared a short, unassuming paper by Wassermann, Neisser and Bruck[1] entitled, "Eine serodiagnostische Reaktion bei Syphilis." This paper drew attention to the possibility of establishing by a biologic test the existence of syphilitic infection in tissue, and suggested that a method might be perfected for regularly demonstrating the presence of syphilitic antibodies in the circulating blood of patients ill with the disease. The clinical possibilities of such a procedure were immediately recognized by other investigators and the use of the test on blood serum and spinal fluid performed according to Wassermann's original method spread rapidly across Germany and France and finally to this country.

The first paper dealing with the reaction to appear in American medical literature was by Fleischmann and Butler,[2] and was published in the *Journal of the American Medical Association* for September 14, 1907. In this paper the authors presented data from which they concluded that the value of the Wassermann test as a diagnostic measure was incontestable, and they commented on the fact that the importance of the method had not so far been sufficiently appreciated in this country. Subsequently, as everyone knows, the Wassermann test has come into general usage throughout the world. It is reported in the United States alone, that during 1923, 165 laboratories of State Health Departments and state institutions performed 990,130 Wassermann tests or approximately one Wassermann test for every 106 people in the country.[3]

THE FREQUENCY OF SYPHILIS IN GENERAL PRACTICE

Syphilis is a common disease occurring among all classes of people, and is responsible for much unhappiness and ill health. It is a highly infectious disease and can be transmitted from one individual to another while the infector is well enough to be about. It can also be transmitted from an infected mother to her fetus. It is responsible for many of the cases in our insane asylums, and it is an important cause of death through its action upon the aorta and cardiac or cerebral vessels.

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* Read before the Fourth Annual Meeting of Pacific Northwest Medical Association, Portland, Ore., June 29-July 1, 1925.

I have analyzed the records of 350 unselected private patients coming to the Peter Bent Brigham Hospital for examination, in order to call attention to the frequency with which syphilis in various forms may appear in a group of private patients. The patients as a whole were fair representatives of the average type of American citizen who supports the medical profession in any town or city in this country. There were 194 males and 156 females, ranging in age from three to seventy-eight years; 244 were American born, the adults comprising all gradations in the social scale from college or bank presidents to day laborers. The average intelligence of the group seemed normal and each individual was eager to pursue any treatment in order to overcome the train of symptoms which rendered necessary a medical examination.

I have selected a small series of "private" patients rather than a large series of "ward" patients as the basis for discussion because most hospitals make it a habit to give their "ward" patients the benefit of a complete diagnostic study and a Wassermann test as a matter of course, while many practitioners are too busy or too careless or too considerate to give their "pay" patients more than a cursory and superficial examination. One of my objects in presenting this paper is to enter a plea for a more generally thorough examination by general practitioners of the ordinary sick man who is unwilling to accept medical charity, but who is unable to afford the services of expensive medical specialists. I also wish to show that the problem of syphilis is almost as serious among fairly well-to-do people as it is among hospital cases.

Of the 350 persons in the series, twenty-nine had positive Wassermann tests. Of these twenty-nine, sixteen, or about 5 per cent of the entire group, had positive tests unquestionably due to an underlying active syphilis.

It is an extremely difficult matter to determine what proportion of the people in this country have either congenital or acquired syphilis. In all probability the number varies considerably in each city and town. So far as Boston is concerned, Cabot[4] estimated in 1911 that between 10 and 15 per cent of the males over eighteen, entering the wards of the Massachusetts General Hospital between 1903 and 1910, gave positive histories or physical signs of syphilis, and concluded that these figures represented approximately the truth about an average sample of Boston's adult males. Hornor[5] in 1916 made Wassermann tests upon a series of 500 patients entering the Boston City Hospital and obtained 87 positive results (17 per cent), while Walker and Haller[6] in the same year analyzed the results of 4000 Wassermann tests, performed on Peter Bent Brigham Hospital patients, finding 600 positives (15 per cent). From such evidence, therefore, it is a conservative estimate to state that the average Boston doctor is seeing approximately one patient with syphilis in every twenty examined, and in all probability doctors throughout the country are seeing about the same proportion of syphilitic cases.

THE SPECIFICITY OF THE WASSERMANN TEST

At the present time nearly every state and city in this country has a laboratory, in which Wassermann tests are performed accurately and at a negligible expense to the patient. While the technic employed varies to a considerable extent in each laboratory, yet the results in any one laboratory are fairly comparable with those obtained in other laboratories, and the practitioner need not be particularly concerned with the method by which the test is performed. He must, however, know how to collect the blood sample and know how to interpret the results which are recorded.

The blood sample is easily obtained. Not less than five c.c. of blood are drawn under aseptic conditions from a vein, placed in a dry, clean, properly labeled test tube, and sent to the appointed serologic laboratory as quickly as possible. In the early days of the test, Wassermann[7] pointed out that any acute febrile disturbance might cause a falsely positive reaction and that protozoan infections such as malaria might interfere with its specificity. Subsequent workers have laid less stress upon the importance of acute infections in causing false positive results, though admitting that any infection, and particularly acute respiratory infection, may be a source of error, but have shown that blood serum containing bile may give an erroneous reaction, as may sera contaminated with bacteria; that ether or chloroform anesthesia may cause a transiently positive reaction, and that a blood sample collected too soon after a meal of food or alcohol may give a false reaction. Most laboratories report Wassermann tests as negative, weakly positive, or strongly positive, believing that a negative test points against, though it does not exclude the presence of active syphilis; that a weakly positive test is of relatively little significance unless repeatedly checked, and that a strongly positive test denotes active syphilis with a very small margin of error. Physicians must bear in mind the common pitfalls of the test, and in doubtful cases have repeated tests made on blood samples drawn at least twelve hours after the preceding meal and uninfluenced by the extraneous factors of fever, jaundice, food, alcohol or anesthesia.

In this series, nine bloods were reported as being weakly positive and twenty as being strongly positive. Of the weakly positive samples, eight proved negative when repeated and only one remained persistently positive. It is of interest that three cases of the group were jaundiced at the time the test was first made. The other five cases had no clinical manifestations of syphilis and, since the weakly positive reaction disappeared when the test was repeated, there seemed no reason for suspecting an underlying luetic infection.

Of the twenty cases with strongly positive tests. at least sixteen and possibly seventeen had active syphilis without much question. In other words, in this particular series, as in many others, which have been reported, the strongly positive test gave reliable diagnostic information in at least 80 per cent of the cases. The few false positive tests are worth emphasizing. One occurred in a patient with myeloid leukemia who gave a strongly positive test, when the spleen was enlarged and the white count much elevated, but who later gave a negative test, when the spleen was smaller and the white count more nearly normal. A second was a patient with Hodgkin's disease, as proved by biopsy, who gave a strongly positive test on one occasion, although several weeks earlier and two or three weeks later the blood was negative. The third patient had advanced pulmonary tuberculosis, as shown by physical examination, x-ray and a positive sputum. There was no history of syphilis and nothing on physical examination to make one suspect its existence. As the patient was referred to a sanitarium for treatment after the diagnosis of pulmonary tuberculosis was established, the significance of the Wassermann finding is uncertain. The fourth patient, who died and was necropsied, had chronic nephritis and fibrous myocarditis. Nothing was found on pathologic examination to suggest syphilitic infection and the reason for the positive test is uncertain.

On the whole, therefore, a strongly positive Wassermann test is not absolutely specific but points to an underlying active syphilitic process in about 80 per cent of the cases. Its results in each case must be interpreted in relation to the clinical findings and weakly positive tests must be checked repeatedly before justifying a positive diagnosis of syphilis.

THE INSIDIOUSNESS OF SYPHILIS

Syphilis is usually considered to be a disease almost certain to produce sufficiently severe symptoms to make anyone infected aware of his condition. Of the sixteen people in this series, who had strongly positive Wassermann reactions and clinical manifestations of syphilis, however, only four knew with certainty that they had ever had the disease; four others remembered that along with an acute gonorrhea they might have had a chancre, and the other eight denied any knowledge of being syphilitic. These figures are in no way remarkable and would doubtlessly be borne out by a larger statistical study.

They suggest three important conclusions. Syphilis in its early stages often passes unrecognized and untreated. Therefore, regardless of the history given by any individual case, the presence of syphilis in some form should always be suspected. Physicians who see patients in the primary stage of the disease should impress upon them the significance of the diagnosis and the necessity for prolonged treatment. It is unfortunate for patients to be left in ignorance in regard to the possible late effects of this disease and it is better to exaggerate rather than minimize the seriousness of the primary lesion. Finally, since many cases with tertiary syphilis are unaware of the nature of their illness and appear with all manner of sypmtoms, and since the Wassermann test will pick out approximately 80 per cent of the unfortunates, the importance of a routine test is obvious.

THE POLYGLOT CHARACTER OF SYPHILIS IN GENERAL PRACTICE

The sixteen syphilitic patients in this series were all typical cases. I shall outline a few of their histories to illustrate the polyglot character of their symptoms and to stress once more the diagnostic importance of a routine Wassermann test.

One patient was examined for diabetes. He was known to have had a positive Wassermann test five years previously, when his pupils were irregular and of sluggish reaction, and the reflex changes and Wassermann test had persisted. He had been given a little salvarsan and mercury on the strength of these earlier findings but had not had any very systematic antiluetic treatment, and a lumbar puncture had never been performed. The interesting feature of his case lies in the fact that shortly after his examination he was sent to prison for passing counterfeit money. Possibly he was a paretic. One wonders how many individuals with unrecognized, active cerebrospinal syphilis are being detained, untreated, in various penal institutions.

A man twenty-six years old complained of stomach trouble. About three years ago he began to feel ill and was x-rayed by an expert radiologist who told him "he had ulcers of the stomach." Subsequently he continued to complain of an indefinite, chronic and periodic sort of indigestion, not entirely typical of ulcer in character, but, on the other hand, suggestive enough except that the symptoms were never relieved by food or alkali. Physical examination was negative. A fresh gastrointestinal x-ray series revealed no evidence of pathology. The blood Wassermann test was strongly positive.

A woman of fifty-five years gave a fairly suggestive history of gallbladder disease. She had suffered from indigestion of five years duration, characterized by "heartburn" accompanied by much gaseous distension and occasional vomiting attacks, aggravated by any sort of fried or greasy food, and punctuated by several attacks of spasmodic pain under the right shoulder blade. There had never been jaundice nor was the pain ever sufficiently severe enough to require morphine.

The physical examination was negative except for unequal pupils and knee jerks. Gastrointestinal and chest x-rays showed no evidence of pathology, although a gallbladder film showed on one occasion a shadow somewhat suggestive of that due to a calculus. On these findings alone, an exploratory laparotomy might possibly have been justified. However, the blood Wassermann test was strongly positive. The spinal fluid had a cell count of fifty-five with an increased globulin content, and the spinal fluid Wassermann was positive.

These last two cases are illustrative of a large series which have been observed at the Peter Bent Brigham Hospital. Often they have entered the hospital after operations for appendicitis, renal and gallbladder calculi, or duodenal ulcer, and not infrequently after several operations, all without relief of symptoms. They have usually improved to a remarkable degree under antiluetic treatment. Therefore, a routine Wassermann test has come to be an important part of the diagnostic study of each case with gastrointestinal symptoms.

A man of fifty-four had been well until about five years ago, when he began having attacks of substernal discomfort, lasting for a few seconds, and passing off with the belching of a little gas. He had consulted various doctors from time to time, who had assured him that his physical condition was normal and that his discomfort was due to a disordered stomach. He had become addicted to the use of soda and other digestive remedies. Finally, he went on a motor trip, and at the end of the day developed an excruciating attack of substernal pain, radiating down both arms, and lasting more or less continuously for twenty hours. Physical examination showed nearly inaudible heart sounds and a very low blood pressure. Fluoroscopy and an x-ray film of the heart showed a normal-appearing cardiac shadow but a notably dilated aorta. Electrocardiographic tracings showed an abnormal ventricular complex, suggesting that often found in coronary closure and cardiac infarct. The blood Wassermann test was strongly positive.

A man of sixty complained of intermittent attacks of severe pain under the left shoulder blade, treated as "intercostal neuralgia" by a doctor. Physical examination showed a normal sized heart with a peculiarly snapping sound at the base, despite a normal blood pressure, and a heaving, expansile, visible and palpable pulsation over the substernal region as far out as the midclavicular line on each side. Fluoroscopy showed so marked a dilated and expansile pulsation in the region of the transverse and descending aorta as to justify the diagnosis of aneurism. The Wassermann test was strongly positive.

These two cases might have been saved a great deal of trouble, had a Wassermann test been made on their bloods several years earlier, and had a proper treatment been started. There are countless similar cases scattered throughout the country which are passing from one doctor to another without a correct diagnosis. While an expert syphilographer is able to detect the presence of syphilis in many cases by routine physical examination alone, the majority of medical men are compelled to rely on the Wassermann test as an important diagnostic aid. A routine Wassermann test performed on the blood of every new case coming to every doctor's office would pick up in the neighborhood of 80 per cent of these derelicts, and active treatment instituted early in such cases would prevent an immeasurable amount of suffering.

THE CAMPAIGN AGAINST SYPHILIS

Since syphilis is a common disease in this country, wasteful from an economic point of view and dangerous from a eugenic point of view, the medical profession as a whole should take an increasingly active stand against it. In 1917, at the beginning of the war, Stokes[8] suggested that the essentials of a comprehensive program for controlling venereal disease including syphilis were as follows: the provision of universally available good treatment, at the expense of the state, if necessary; the provision by the state of efficient means of recognizing the diseases at the earliest possible time and with the greatest possible certainty in any given case; the suppression of quack practice and advertising of cures for these diseases; and, finally, moral and educational prophylaxis with the vigorous suppression of prostitution. When he made these suggestions, he felt keenly the backwardness of the United States in preventing the spread of venereal diseases, and the lack of any well organized national program to combat them. What tangible advances have subsequently been made in overcoming these illnesses in this country are uncertain.

Of a group of two hundred unselected male patients more than twenty years old, fifty-eight, or 29 per cent, admitted having had gonorrhea, usually at some period in their early youth. It would seem probable that the decade between twenty and thirty is the dangerous age for venereal exposure, since men at this time are likely to be more hot blooded, and less restrained and responsible than in the later years. Therefore, these patients were tabulated in age groups in an attempt to determine whether venereal disease is as prevalent among young men now as it was twenty or thirty years ago. The results of this survey are recorded in the following table:

The prevalence of a previous gonorrheal history in a group of 200 male patients.

Number	Age	Per cent with previous gonorrheal history
36	60 or over	17
43	51-60	33
39	41-50	46
50	31-40	30
32	20-30	15

It is suggested from this series that a smaller proportion of young men are now acquiring gonorrhea than were acquiring it previous to the general antivenereal propaganda and education which was instituted during the war and that, therefore, venereal disease is becoming less common. While the number of cases is obviously too small to warrant any conclusion, yet such figures are encouraging.

On the other hand, to take an opposite point of view, Frothingham,[9] in 1923, analyzed the rules for admission of cases in twenty-seven hospitals scattered through various cities and towns of Massachusetts, and found that in nineteen charity patients with acute syphilis were refused entry. In other words, in these localities such cases were practically debarred from care at a time when they were most infectious and dangerous to their communities. If a wider survey of hospital regulations throughout the states showed similar rulings in many hospitals, it would appear that large numbers of syphilitic patients are being refused adequate treatment, are being encouraged to spread the disease or to support quackery, and that public health administration has not advanced to any degree during the last few years. Furthermore, that such rules discriminating against the admission of cases of acute syphilis to the open wards of a hospital are unnecessary is shown by the experience of the Peter Bent Brigham Hospital. Here such cases have been regularly admitted to the open wards since the hospital opened, and have been cared for with the same precautions that apply to cases of pneumonia, typhoid or any other acute infectious disease. So far no cases of cross infection in the hospital have developed.

Finally, we must remember that, regardless of what may be accomplished in preventive medicine through public health regulations, propaganda and education, syphilis will continue to be a common disease, and many patients will not fall into the group of cases which will be cared for in hospitals, but will prefer to rely on their family doctors for diagnosis and treatment. Therefore, practicing physicians must recognize their responsibility toward syphilis. Each patient who consults a doctor has a right to expect a careful history of his case, a thorough physical examination and such laboratory studies as are necessary to complete the diagnosis. A Wassermann test made on the blood of each case, regardless of the symptoms or social condition of the patient, will establish the diagnosis of syphilis in many unsuspected cases, and is an important part of any comprehensive examination. Intelligently interpreted in regard to diagnosis, future treatment, advice as to marriage and method of life, it will go far in helping to prevent the more serious complications of this disease.

SUMMARY AND CONCLUSION

This paper reports an analysis of the histories of 350 unselected private patients with a view to determining the occurrence of syphilis in private practice, and in order to illustrate the diagnostic importance of a routine Wassermann test. Of these patients, approximately 5 per cent were suffering from some form of syphilis. An underlying syphilis was present in at least 80 per cent of the cases with strongly positive Wassermann tests. Therefore, the Wassermann test was of great diagnostic importance.

The prevention and treatment of syphilis is not only a public health and hospital problem, but is also a very important problem in private practice. Many patients with syphilis appear with symptoms suggesting other illnesses and are unaware of any primary lesion. Such cases can be recognized through a routine Wassermann test, and may be overlooked by other examinations.

A private patient has as much right to expect a careful history, a thorough physical examination and laboratory studies for the purpose of diagnosis as has a ward patient. Wassermann tests can be performed accurately for these patients and at negligible expense in most of the larger cities of the country, and are an important part of a thorough examination.

A Wassermann test performed upon the blood of each private patient consulting each doctor in the country would establish the diagnosis of syphilis in many unsuspected cases, and by indicating proper treatment would go far in helping to prevent the later complications of this disease.

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INFECTION WITH THE PARASITE OF SYPHILIS

TREATMENT AND CARE OF THE PATIENT[*]

H. M. Greene, M. D.
PORTLAND, ORE.

One of the problems confronting the medical profession at this time is the control and cure of syphilis. During the past twenty-five years more work has been done and greater progress made in syphilology than in any branch or department of medicine, and yet we observe that a great majority of syphilis, even early syphilis well treated, when put to the test, remains uncured.

Twenty-five years ago the late Sir William Osler[1] wrote, "It is to be remembered that syphilis is common in the community and there are probably more families with a luetic than with a tuberculous taint." Since that time the domain of syphilis has been definitely extended by aid of the laboratory, so that some of the medical profession are beginning to realize the prevalence of the disease and appreciate the task connected with the treatment and care of patients infected with the parasite of syphilis.

THE CURE OF SYPHILIS

The United States Public Health Service issues the following in a bulletin published in December of 1924.[2] "The indiscriminate use of the word *cure* in the treatment of syphilis should be discontinued and in its stead the patient should be made to think merely of an arrested condition as in tuberculosis."

This brings us to the realization of the fact that the treatment and care of the patient with syphilis presents a problem similar to the treatment and care of a patient with tuberculosis; and that the cure or even control of syphilis is not accomplished by the intensive use of any remedy or combination of remedies over a short period of time, even until the blood test is negative.

We have also come to realize that the nonspecific factors in the treatment of syphilis are just as important as in the treatment of tuberculosis; and that plenty of fresh milk, raw eggs, rare meat, ripe fruit, and fresh vegetables with whole grain cereals and bread, together with hygienic living and the avoidance of intemperance and excesses, are necessary in the cure of syphilis. A trip to the sea shore, where there is fresh air, sunshine, good food and recreation, will often accomplish much in an unmanageable case. The removal of focal infections is not only important but essential for success.

CONCERNING THE USE OF DRUGS

The use of active remedies over a long period of time to the patient's tolerance is required. Such procedure is warranted, if for no other purpose than to prevent the spread of the disease; and such procedure is necessary in order to save the patient from future relapse and chronic invalidism.

It is important, however, not to indulge in the intemperate use of drugs to the detriment of the patient's health. Therefore, constant observation is required and frequent examinations necessary during the active treatment of the disease, in order to know that it is under control and to know that a permanent damage or a total destruction of vital organs is not being produced by the untoward action of potent remedies.

Every patient is a law unto himself and each infection has its degree of virulence, so that measures tolerated by one individual will produce disastrous results when used with another. So particularly in the treatment of syphilis is eternal vigilance the price of safety.

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Many remedies are of value; some appear to be specific in some cases, but in a great number of cases a relapse is the rule, even with the greatest care on the part of both the physician and the patient.

The most active remedy against the parasite of syphilis known at this time is arsenic. The new preparation, invented twenty years ago under the name of salvarsan, has been improved upon in many ways and at this time is marketed in a variety of forms.

Sulpharsphenamine I believe to be the remedy of choice in the majority of cases. It is less irritating to the tissues and may be administered intramuscularly without great discomfort to the patient; and when administered intravenously it is not so frequently followed by violent reactions.

On account of its nonirritating qualities we may presume it to be more acceptable to the choroid plexus and passes through into the cerebrospinal fluid in greater concentration. Observations of this nature have been confirmed by good authority.[3] Therefore, for this reason its use in early syphilis is particularly desirable in order to prevent the localization of the disease in the central nervous system.

There is much argument against the use of sulpharsphenamine, since it will produce a dermatitis more readily than any of the other arsphenamines. In other words, this proves that it does have an affinity for ectodermal tissues and, therefore, would have a selective action on the tissues of the central nervous system. "The entire nervous structure, it will be remembered, is composed of epithelial cells variously modified."[4]

The conjoint use of arsenic and mercury is not recommended. They are physiologic incompatibles. Arsenic is an irritant to the liver and mercury to the kidneys, so that the one stands in the way of the elimination of the other. When these two remedies are used together, the corresponding dose of each should be proportionally reduced. It has been my custom to use the arsenicals at the maximum tolerated dose until the disease is under complete control, and then administer mercury in comparatively small doses with suitable rest periods over a long period of time, particularly for its resistance building effect. The iodides are very essential in the treatment of syphilis and can be used either alone or conjointly with arsenic, mercury, bismuth, sulphur, iron, and various other nonspecific remedies. This remedy stimulates glandular secretion and increased oxidation. It increases the amount of blood in the fine capillaries and promotes extension of the circulating blood into calcified and fibrosed areas which serve as depots and havens for the parasite of the disease, and tends to bring about their dissolution, so that the killing remedies, arsenic, mercury, and bismuth may be able to register a hit. To get active remedies against the parasite into the blood is easy; to get them to the hibernating parasite is the problem.

If there is a sporocyst or resting state of the parasite of syphilis, iodide would, theoretically at least, be the remedy of choice to dissolve the cyst wall on account of its oxidizing action and thereby to reduce the resistance of the hibernating parasite to active therapy.

THE ZERO HOUR

Is there a zero hour for the administration of the arsphenamines? I am convinced there is, and during the past three years I have been using them with this idea in mind. Also I believe that there is a resting state or sporocyst of the parasite which has an incubation period of twenty-one days, when conditions are favorable to its development and longer, if conditions are not favorable. McDonagh[5] describes a resting form of the parasite of syphilis and others have theorized on the subject. With a resting state uninfluenced by active remedies we are able to account for relapses in well treated cases and otherwise arrested conditions of the disease.

A treatment administered on the theory that there is a resting state of the parasite of syphilis with an incubation period of twenty-one days and a zero hour for the administration of the arsphenamines is carried out as follows:

Four or five doses of the arsphenamine are administered at frequent intervals in conjunction with the iodides by mouth. After it is apparent by clinical evidence and serologic findings that the disease is under control, then the interval between doses is increased to twenty-eight days—seven days required for the elimination of the previous dose plus the twenty-one day incubation period of the disease.

The advantages of this program are numerous, while the results are equal, so far, to the results obtained by any other routine. It makes it easier for the patient to continue with his treatment.

On account of the long interval between doses the size of the dose may be materially increased without injury to the patient. This gives a higher concentration of the remedy in the blood and consequently more of the remedy will penetrate areas, where the circulation is poor and where we presume the parasite of the disease seeks to hibernate.

Time is afforded to observe any untoward action of the remedy, so that treatment may be discontinued before there is a sufficient accumulation of the drug to produce disastrous results. A greater total amount of the remedy may be administered because of the extended time; and it must be remembered that time is an essential element in the treatment of syphilis.

LABORATORY FINDINGS

The most important thing in the treatment and care of a patient infected with the parasite of syphilis is to get the cerebrospinal fluid normal. To know this requires lumbar puncture, often many of them, and a subsequent examination of the cerebrospinal fluid by a competent serologist. Just so long as there is increased pressure, increased cells above three per c.mm., increased albumin content, increased gold sol reaction, the presence of globulin, or the presence of a positive Wassermann reaction on 2 c.c. of the fluid, using Kolmer's antigen with fresh complement, just so long does the patient remain actively syphilitic and subject to the development of paresis, tabes, syphilitic insanity, sudden death or chronic invalidism by cardiovascular degeneration; and just so long is he able to infect an innocent marital mate and produce a syphilitic offspring. An individual once infected with syphilis requires observation for years and the findings in the case should be a matter of record in the office of the State Board of Health; and the marriage of an individual once syphilitic to a noninfected partner should require the sanction of the Secretary of the State Board of Health. This could be carried out as at present by the present numbering system now required for the reporting of venereal diseases. Only follow up measures would be required.

LUMBAR PUNCTURE AND EXAMINATION OF CEREBROSPINAL FLUID

Lumbar puncture can be done without great pain or inconvenience to the patient, if the procedure as outlined by me in a former communication is carried out in detail.[6] By this method the serious prostration and severe headaches caused formerly are entirely done away with in my own hands and in the hands of others using my method; so at present there are no reasons for not doing lumbar punctures often during the course of the treatment of syphilis.

The examination of the cerebrospinal fluid should be done by a competent serologist and should include the following:

The color of the fluid may be observed and the pressure taken by the operator at the time of puncture. Very little fluid is required for this examination.

If there are no red cells in the fluid, the white cells are readily counted and should not exceed three per c.mm. Not more than two drops of fluid are required.

Globulin may be estimated by Pandy's reagent. This requires two to three drops of fluid. No globulin is found in normal cerebrospinal fluid by this test.

Albumin may be estimated as to amount by the use of Tushia's reagent and a small centrifuge tube, a method which I have devised. Seven-tenths c.c. of the fluid are required for this test, with 0.3 c.c. or reagent. To facilitate the examination the tube may be graduated. Then the fluid is put into the tube up to the first mark and the reagent added up to the second mark; the two mixed and set aside for a few minutes and then centrifuged. A normal fluid contains a small amount of albumin, a column one to two mm. high in the small end of the tube. In tabes, paresis, brain tumors, or any active degenerative process in the brain or spinal cord the column of precipitate may be ten to twenty mm. high.

The gold sol test by Lange's colloidal gold solution is very important and gives much information. Extreme care, standard reagents, and meticulously clean ware are required for this test. This requires 0.2 c.c. of fluid.

The complement fixation test, Wassermann test, should be made quantitatively, using 2 c.c. in the strongest dilution, with Kolmer's antigen and fresh complement to prevent anticomplementary reactions in the control tube, which also requires 2 c.c. of fluid. Six c.c. of fluid are required for this test. Therefore, at puncture 10 c.c. of fluid should be taken to complete the entire routine of tests as outlined.

THE RECORDS OF THE CASE

In order to study the effects of the treatment and the untoward action of potent remedies in relation to the physical condition of the patient, in combination with remissions and exacerbations of the disease over a long period of time, as evidenced by clinical symptoms and laboratory findings from time to time, it is imperative to keep a detailed record of the case by making notes each time the patient is seen. The record should start by a complete physical examination of the patient which should be recorded on a blank suitable for the purpose.

A treatment chart is required, so that the dose of each remedy may be recorded and the following reactions, if any, noted. A separate file should be kept for each case in order to preserve copies of prescriptions and other data of importance, arising in connection with the patient and his disease.

CONCLUSIONS

1. The prevalence of syphilis warrants that the physician should give more attention to the treatment and care of the patient infected with the disease, in order to prevent chronic invalidism and the spread of the infection, particularly by hereditary transmission.

2. General hygienic living and dietetic measures are just as important in the treatment and care of syphilis as in any chronic disease.

3. The intemperate use of drugs in the treatment of a patient with syphilis is as detrimental to his health as other intemperances or excesses, and promote the extension of the disease.

4. In order to know that the disease is completely arrested, a normal cerebrospinal fluid must be present, as well as negative findings in the blood, together with the disappearance of all clinical evidences of the disease.

5. Annual follow up reports should be required by the state from the physician for every case, in order to prevent the spread of the disease.

6. The keeping of complete records in every case is essential.

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1206 Stevens Bldg.

SYPHILIS OF THE AORTA*

JAMES B. HERRICK, M.D.
CHICAGO, ILL.

It was Ricord who said that a thorough knowledge of all other diseases was necessary in order effectively to study syphilis. Conversely we may say that a thorough knowledge of syphilis is necessary in order that all other diseases may be well understood. These statements are eminently true of the cardiovascular system. A knowledge of other diseases of the heart and blood vessels enables us correctly to estimate the part played by syphilis in affections of these organs. A familiarity with the idiosyncrasies of syphilis fits us to read its hieroglyphics as revealed by clinical symptoms and autopsy findings.

Syphilis may affect the blood vessels in any part of the body—the cord, brain, kidney, extremities—and these lesions may be serious so far as effects on health are concerned. Yet in no part of the body is the damage wrought by lues more ruthless, more life-threatening than in the aorta and the heart itself. It is to this aspect of syphilis that I wish to call attention today.

The subject is an old one. Morgagni in the eighteenth century described the aortic lesions in connection with aneurysm; Corrigan depicted them in the early nineteenth century. Yet there was no general recognition of the frequency of the condition in the heart and aorta nor of its potential and actual dire consequences until the latter part of the last and the early years of the present century. Then Doehle, Heller, Chiari in Germany, Huchard, Dieulafoy, Fournier in France, Allbutt in England, to mention only a few names, drew attention to its pathologic and clinical features. Schaudinn's discovery of the spirochete of syphilis in 1905, followed by Ehrlich's and Wassermann's fruitful announcement of "606" and the specific serum reaction, gave a tremendous impetus to the study of syphilis in general and focussed attention more closely on this disease as it affects the heart and aorta. Of late years much clinical, pathologic and statistical work has been done as evidenced by a rich output of literature on the subject that need not here be mentioned. Fahr (1904), Herxheimer (1907), Longcope (1913) give quite full bibliographies and review of the literature. Warthin's contributions are especially worthy of note.

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Even today, however, there is much diversity of opinion as to the frequency of aortic and cardiac involvement, what portions of the aorta and heart are chiefly affected, what are the possibilities of recognizing the condition during life, what is the prognosis, what the results of treatment and even what are the unimpeachable evidences postmortem. The topic is, therefore, a very live one; there are many questions still unsettled; yet enough facts are established to warrant the presentation of this subject to you today as one of interest and increasing importance to both specialist and general practitioner.

There has been a general consensus of opinion that the portion of the aorta most frequently and most markedly affected is the first or suprasigmoid area. Here are found in the earlier stages the bluish-gray circular or oval, semitranslucent, discrete, slightly elevated patches that represent the invasion of the wall of the vessel by the spirochetes which on proper staining are often shown to be present in large numbers. Here later are found the more yellowsh grayer, puckered, more fibrous patches that denote the more advanced process.

Some observers like Warthin remind us, however, that the first few inches of the aorta have no monopoly on the localization of syphilis. Other portions of the arch, the descending thoracic aorta and the abdominal aorta, especially where branches such as the renal arteries are given off, will often show, if examined carefully by naked eye and in properly stained specimens, unmistakable evidence of the disease. I shall refer later to the fact that the first inch may be spared, though higher up there may be marked lesions.

Why, then, such emphasis on the first portion of the aorta? We may answer because of three facts. Disease here is prone to involve simultaneously or by direct extension the aortic valves, or it may obstruct the mouths of the coronaries or invade the coronaries themselves, and lastly, subjected as it is to the full force of the systolic output of blood from the heart, the aorta, if diseased at this point, is especially prone to yield in cylindrical or sacculated aneurysmal dilatation. Furthermore, anginal symptoms may have been present. No wonder, then, that pathologists and clinicians have their attention attracted particularly to these few inches of the aorta, as they consider the striking anatomic and functional changes in cases of aneurysm, aortic valve or coronary disease, angina pectoris, or secondary chronic fibrous change in heart muscle.

I shall omit details of the pathologic process. It is enough to know that, as the result of a spirochetal bacteriemia, the wall of the aorta is invaded by way of its vasa vasorum and a process characteristically syphilitic, largely gummatous, is set up sometimes spoken of as a specific mesaortitis, though all coats are involved. What we are interested in is how these anatomic changes affect the function of aorta, valve, heart, how they affect the health, how they kill, how they may be recognized during life by signs and symptoms and then whether we can do anything to prevent or relieve the condition.

If nothing can be done for these cases either early or late, their recognition is merely a matter of academic interest. If, however, as most believe, an early recognition makes possible appropriate specific treatment that is distinctly helpful in warding off the severer later consequences, it is necessary to know how to detect the first symptoms. This resolves itself into the recognition of syphilitic aortitis. Can this be done? I know some physicians who aver that, unless the process be advanced and associated with aortic leak, a diagnosis of this type of aortitis is impossible. I know others who believe it possible with reasonable certainty to recognize this condition largely by physical signs, even at a very early stage. Perhaps the truth lies somewhere between these two extreme views. Much depends on one's ability in the way of physical diagnosis. Much depends on the mental attitude of the examiner, for one may speak with cocksure positiveness regarding his interpretation of signs and symptoms, feeling that the diagnosis was established, while another may view his opinion as merely a guess or an approximation to a diagnosis.

If I say comparatively little concerning aortic regurgitation, aortic aneurysm, fibrous myocarditis, it is not because I underestimate their importance as diseased conditions but because they may be assumed as better understood. Angina pectoris has already been discussed in a previous lecture.

I have been accustomed to teach that there are three reasons why early syphilitic aortitis will often be overlooked. In the first place, in many instances no symptoms are present, at least none that attract the patient's attention. No diagnosis is made because he does not consult a physician. Then the symptoms may be so slight, the signs so obscure as to throw the physician off his guard and he examines heart and aorta in only a cursory manner and overlooks what he might be able to detect, were his thoughts on the possibility of aortitis rather than on muscular rheumatism, due perhaps to infected tonsils or teeth, or on a neurosis or a disordered stomach. Lastly, early aortitis may be overlooked because it may elude the most exacting examination of even the well informed, skillful doctor.

How to recognize it? The commonest symptom is pain. It is present in probably 75 per cent of cases. It may be very slight or severe. The patient may describe merely a substernal burning, or an ache that seems to be aggravated by exercise. Occasionally the relation to effort, the full meal, together with the radiation to the neck or arms, may be frankly anginal. I am speaking of pain in the earlier stages before pressure from aneurysm has developed, before aortic leak, thickened arteries, large heart and coarse anginal attacks make diagnosis of aortic damage almost self-evident. I am sure we often fail to assess these slighter pains at their real value. Especially in a neurotic individual are we apt to dismiss too abruptly the complaint of sternal or precordial pain, when we fail to find evidence of valvular or myocardial lesion.

We must remember in this connection that aortitis may develop in those comparatively young. Longcope's statistics are illuminating. He found 50 per cent of his patients under forty and 80 per cent under fifty years of age. There is another factor worth noting. We are prone to regard this disease as a late manifestation of syphilis, to look for it long after the initial syphilitic infection. It is true that in general it is detected only when syphilis has been present for several years. But aortitis may be an early result. One may go further and state that it probably is in most cases a much earlier condition than is generally supposed. Not a few cases are recorded in which distinct clinical symptoms were noted as early as three and four years after the chancre. The point I desire to make is that because pain — together with other symptoms—is present soon after the initial lesion, aortitis is not to be dismissed from our thoughts. Rather should we think hard upon the subject for, if the pain is indicative of a syphilitic aorta, the golden—i.e., arsenical—opportunity for treatment is the present.

Other subjective symptoms that may be noted are dyspnea, palpitation, tachycardia and malaise. In the advanced stages, when pressure is high and the heart large, paroxysms of dyspnea of the cardiac asthmatic type may be annoying. With long standing aortic leak, especially if there are associated coronary and fibrous myocardial changes, ordinary effort dyspnea may be present. Difficult breathing under these circumstances plainly calls attention to the circulatory system and the evidence of pronounced aortic change will be easily elicited. But moderate degrees of dyspnea on exertion or dyspnea coming on in unexplained brief though mild paroxysms may be significant of the earlier stages of aortitis and of accompanying myocardial weakness. They should not be neglected.

There may be complaint of palpitation. The heart may be irritable as to rate, going to 100 or over on slight provocation. The patient may realize that his pulse is inclined to be rapid. To repeat what I have just said, there is danger that the physician will pass over these symptoms as manifestations of an irritable heart. They are not unlike that peculiar cardiac neurosis — vague precordial pain, tachycardia, palpitation, trouble in breathing. Some patients complain of malaise, poor appetite, some loss of weight, and occasionally there is a slight rise of temperature.

The remaining fact elicited from the questioning will be the history of syphilis. I need not take time to discuss the importance of this feature of the diagnosis, the difficulties sometimes encountered or the technic. This is self-understood. I may add parenthetically, however, that doctors differ remarkably in their ability to get information out of a patient, as do lawyers in their examination of witnesses. Personality, tact, experience, a knowledge of human nature, all contribute to enable the one man, the artist, the practitioner, to succeed, where the other man, perhaps equally or more learned, fails.

But the knowledge that syphilitic infection occurred some years before, the complaint of precordial distress, dyspnea, palpitation and malaise do no more than arouse suspicion of aortic or cardiac trouble. What may be learned on examination? The two findings that have been to me of the greatest help have been a murmur over the base of the heart and a ringing, metallic, clanging aortic valve closure.

If the murmur over the aortic cartilage or over the sternum below this location is diastolic, clearly indicating an aortic leak, in the absence of any history of rheumatism or chorea, and without evidence of other valvular lesions, we are justified in the young adult in strongly suspecting or even assuming that the leak is due to syphilitic changes in the aortic cusps and that there is an associated syphilis in the aortic wall. But more than this, in the nonanemic individual under forty with no general arterosclerosis, no evidence of aortic valve involvement, with the patient at rest and a heart beating in a nontumultuous manner, in such an individual systolic murmurs over the aorta should have no place, if the aorta is normal. Such a systolic murmur speaks strongly for a diseased aortic wall with roughening or dilatation. We are justified in so interpreting it without the presence of a diseased aortic valve, because it is shown by postmortem examination that in a large proportion of cases of syphilis of the aorta the valve is spared, the syphilitic process being situated elsewhere than within the first inch above the sigmoid valves. At the meeting of the Association of American Physicians in May of this year several speakers, Maclachlan, Warthin, Karsner, stressed this point that aortic valve involvement was not necessarily an essential element in aortic syphilis. Maclachlan stated that the beginning of the process was most commonly one and one-half to two inches above the aortic valve cusps. This being so, we must not magnify too much the diastolic murmur of aortic regurgitation as a requirement for the diagnosis of luetic aortitis. We must aim to recognize the condition even in the absence of this murmur and to this end are justified in viewing with suspicion even a faint systolic blow, such as I have just described.

An accentuated aortic closure is no rarity in cases of hypertension from any cause. It is met with in general arteriosclerosis as in the aged and in chronic nephritis. But with luetic aortitis there is a peculiar sharp, metallic quality that tempts one to speak of it as pathognomonic. More than once it has been the one finding that has attracted my attention to the existence of a syphilitic lesion of the aorta. Why this is so is not entirely clear. In many of these cases blood pressure is not high. A change in the physical make-up of the aortic wall or the valves may alter the timbre of the tone. Further, in some instances by dilatation of the aorta and pushing aside of overlapping lung the valves are brought closer to the chest wall. Whatever the correct explanation, the fact remains that the finding of this peculiar metallic, bell-like type of aortic closure is of great help in establishing a diagnosis.

When syphilis attacks the aorta, the wall is weakened and the aorta becomes dilated and lengthened. The detection, therefore, of a broad, tortuous or lengthened aorta means one more link in the chain of evidence showing syphilitic aortitis. All physicians of reasonable skill as physical diagnosticians would detect the signs of markedly enlarged aorta in the later stages. But physicians of experience do not by any means agree as to the value of palpation and percussion in detecting increased width of aortic dullness. I know some who believe that, if careful percussion in a quiet room be practiced, the trained ear and finger will reveal shades of dullness that permit of only one interpretation—a dilated aorta. They believe that even slight increase in dullness may thus be made out. Others are far more hesitant about accepting or interpreting what to them are doubtful alterations in sound. They have in mind the many variations that might be found in normal chests. Individual skill and self-confidence here count for much.

The same difference of opinion exists as to the interpretation of x-ray findings. Vaquez and his school insist on the possibility of detecting and interpreting minute changes in contour. They give details of linear measurements that to them are conclusive evidence of aortitis. They speak with astonishing assurance of the certainty of detection and the significance of these findings. Others are far more conservative, cite instances of misinterpretation and the many chances of error due to failure to recognize variations from a none too fixed type of cardioaortic silhouette.

There is only one safe way, to examine with utmost care by percussion, and to palpate in the episternal notch for undue pulsation. By fluoroscope and plates map out as accurately as possible the width, course and length of the aortic arch and then put down results, not as one thinks they may be or might be or ought to be but as one in the light of skill and experience knows them to be. Only in this way will the physician and roentgenologist acquire that skill in physical diagnosis and in the making and interpretation of plates that will enable them to state with assurance that an aorta is definitely broadened, lengthened or tortuous. I may add incidentally, what is surely unnecessary, that in studying the aorta by the x-ray it is important to remember that the examination should be made not alone in the anteroposterior positions but in the oblique as well, so as to catch possible posterior bulgings, and that quantitative results are of relatively slight value unless orthodiagraphic or distance plates are made.

I have discussed the diagnostic value of symptoms—pain, dyspnea, palpitation, tachycardia, malaise, fever; and the signs—diastolic and systolic basal murmur, ringing aortic closure, enlarged and deformed aorta. The next step is to prove, if possible, that the patient has had, or still has syphilis. Some may say this should be done first. They may be right, though this order of procedure is apt to make one careless in the rest of the examination. Proof of syphilis before beginning the examination may lead the physician to see the signs of aortitis when perhaps they do not exist. Failure to find such proof may cause him to ignore the symptom or sign that is really significant.

Naturally the patient is questioned as to his past. He may know he had syphilis and may frankly admit it. Often as is well known he conceals this knowledge because of shame or because he thinks the disease cured; this chapter of the book is closed. But often he does not know of the previous or present existence of the disease. The physician must hunt for evidence of it.

It seems trite to repeat what we all know about this subject. I would apologize for mentioning it, if it were not for the fact that not once but many times have I seen syphilis overlooked—I am not now referring merely to cases of aortitis—because the examination has been hurried or superficial, at times because the suspicion of the disease has not been keenly aroused by symptoms or history. I have had my own embarrassing episodes of this character.

I will not weary you by presenting an encyclopedic list of syphilitic manifestations. Let me call to mind the help often obtained from the history—the stubborn sore throat years ago, the alopecia, the rash, the adenopathy, the nocturnal headaches, the sore on the leg cured by taking drops in increasing doses, the miscarriages, the lightning pains, the diplopia, the epileptiform seizure, etc. The stigmata—the penile scar, the tissue-paper scars on the shin, the perforated nasal septum, the scarred throat and atrophied base of the tongue, the adherent iris, the pupil irresponsive to light, the indurated testis, the scar in the lung, the sabre shin, the deformed liver, the large spleen with anemia, the delusion of grandeur, etc.

Nearly all cases of syphilitic aortitis show a positive blood Wassermann reaction. Where this is negative, the study of the spinal fluid may still give proof of syphilis. The blood test should always be made; the spinal fluid test is advisable. Of great importance, though often forgotten, is the fact that a negative Wassermann does not necessarily rule out syphilis.

If care be exercised, then, in eliciting the history and in examining, and if the blood and spinal fluid be studied, syphilis will seldom escape detection. Rarely the beneficial results of treatment give support to an otherwise halting diagnosis.

If, then, symptoms and signs are as clear as I have portrayed them, why does it happen that so many cases go unrecognized until the later, hopeless stages. The answer I have already given. Many patients never go to a doctor in the early stages; the disease may be overlooked because the symptoms are trifling or the examination not thorough; many cases defy an accurate diagnosis in the early stages.

The general impression seems to be that syphilis of the aorta, and especially when it involves the aortic valves, carries with it an unfavorable outlook. The recent study of aortic valve syphilis made by Scott led him to this conclusion. Apparently, however, he is considering the course of the disease from the time the patient first came under observation, which was the time of cardiac breakdown. Many of these cases, also, had not been recognized until the breakdown. The disease may have existed long before. Had it been earlier detected and the patient promptly treated for syphilis rather than for decompensation, the history might have been very different and a statement justified that prognosis is not so uniformly bad.

While I can offer no statistical evidence to the contrary, I must say that there are exceptions to this rule. I have seen several cases of aortic leak of syphilitic origin, where to my surprise the process has lasted many years, symptoms being very mild.

I have, I think, in my lectures been rather sparing in my citation of cases. May I, therefore, venture to report in outline four cases of syphilitic disease of the aorta and the aortic valves. The object is to show four different types, or rather to show how the progress of the disease may vary very much, in one a rapidly fatal result, in another a malignant course, in a third a slowly advancing process and, lastly, a condition seemingly stationary.

Case 1. Several years ago a physician asked me to look at an ambulatory case that had come under his care. The woman was about thirty, had been married less than three years, had the appearance of health. The only symptom complained of was an occasional ache or pain in the sternal region which sometimes ran out toward the shoulder or even a short distance down the left arm. Sometimes walking appeared to cause the pain. She was somewhat apprehensive and the doctor was disposed to view the trouble as neurotic. Three suspicious circumstances, however, led me to advise a Wassermann test and an historic inquiry as to syphilis—a faint systolic blow over the aorta, a faint diastolic aortic murmur and a somewhat rapid pulse. Five days later the doctor met me and told me that to his surprise the blood Wassermann was strongly positive but, more than that, the woman had died suddenly the day before, i.e., four days after my examination and before she had had a dose of medicine.

Case 2. A man of about forty was brought into the office by a doctor who bluntly declared before the patient that the man was lazy, a coward, perfectly well if he only thought so, etc. For many weeks he had daily dragged himself down to work, stopping frequently because of severe substernal pain. As the doctor said, he was unnerved, avoided work and possibly was cowardly in the matter. Two things, however, made me decline to agree that the whole trouble was imaginary or functional. The one was a faint yet distinct systolic murmur over the aortic region. The other was the fact that he told the same story regarding each attack—pain always following walking, always substernal, always necessitating his standing still, always with a sense of impending danger. Advice as to rest, use of iodides, etc., was not taken. He was opposed to drugs, embraced christian science. Seven years later he came to me in the hospital, orthopneic, edematous, with huge heart, loud double aortic murmurs, extremely wide aorta. He died suddenly a few days later, while reaching from the bed to get his book on christian science.

Case 3. During my internship in the Cook County Hospital, Chicago, I treated a patient by iodide of potassium and mercury for a lump on his forehead. The marvelous and prompt disappearance of this lump, clearly a gumma, for which a surgeon advised operation believing it a sarcoma, caused the man to come ever afterwards to me, whenever he got into serious trouble. I have seen him, therefore, at odd intervals since 1888, thirty-seven years. Epileptiform seizures, dizzy spells, headaches, a gradually increasing blood pressure, dyspnea were the conditions noted. Lately, however, marked dyspnea, cardiac asthma, angina, with pressure of 240, huge heart, gallop rhythm show that the end is not far off. The man is seventy years old. I do not know how long the aortic syphilis has existed, nor how much disease of the coronary arteries there may be. But surely the progress can hardly be looked upon as very rapid. From the time of his initial lesion to the beginning of serious breakdown is more than forty years. At no time has he submitted to what would be called intensive antisyphilitic treatment, though at times he would take mercury or iodide.

Case 4. A man of fifty consulted me for bladder symptoms which rather tardily I recognized as due to tabes. He had a definite aortic leak, concerning which some doctor had spoken a few years before. He had never had rheumatism. There were no heart symptoms, merely the unmistakable physical signs. I treated him at irregular intervals for perhaps fifteen years. Only toward the last did his heart show even slight evidences of incompetency. I am sure the valvular lesion had existed, practically symptomless, for twenty years. I later saw his wife with a cirrhosis of the liver, doubtless syphilitic.

The whole purport of this talk is to make a plea for a more careful study of cases, to the end that those of a syphilitic nature may be recognized in an early stage when treatment offers hope. To present to our classes in the medical school huge aneurysms that bulge from the chest wall or show as enormous shadows in the x-ray; to have the students listen to the startling sounds of an advanced aortic leak; or to have a sufferer from angina pectoris or myocardial degeneration relate his pitiful story, all this is profitable and should be done. But the pathos of it all, the tragedy, comes out when we learn of the initial lesion thirty years ago unrecognized or treated in a half-hearted way; of the episode of the substernal distress and other symptoms of twenty years ago curtly dismissed by the doctor as neurotic, and of his advice to "forget it," pathetic and tragic because we believe something, perhaps much, might have been accomplished by early energetic treatment, with later close observation and perhaps repeated treatment.

All this means that the way to treat syphilitic aortitis is to avoid syphilis—easy to say, hard to accomplish, whether the method you believe in is moral or religious teaching, education as to scientific facts, segregation or inspection of prostitutes or medicinal prophylactic local measures during or following intercourse. It means intensive treatment by skilled experts as soon as the disease is recognized, by arsphenamine, mercury, whatever is regarded as the very best for the particular case. Some of the best work I know of is being done today in some of the out-patient departments of hospitals and in dispensaries.

Take as example that of the Massachusetts General Hospital or the Central Free Dispensary of Rush College in Chicago. In the latter institution some 12,000 visits for slavarsan, given almost entirely to patients with active primary or secondary manifestations of the disease. Surely we are not exaggerating when we say some later visceral lesions will be warded off or lessened in severity by such treatment. In Chicago there is a Public Health Institute, started and backed by wealthy laymen, an Institute that has aroused much resentment and antagonism on the part of the doctors because its methods are not above criticism. This institution charging minimum fees is self-supporting. It claims to treat nearly 1000 patients with venereal disease daily. Two hundred Wassermanns a day, etc. Now, granting that there are objectionable features as to advertising, machine-like handling of patients, and in some other respects, we must yet admit that, if its doctors are keen as to diagnosis, honest in their advice to patients, and reasonably skillful in the use of drugs, they are doing much in the way of prophylaxis, and we trust, of cures. If these dispensaries and institutes continue their work and if early treatment cures or helps, there should be in the next few decades an appreciable lessening in the number of cases of general paresis, tabes, thoracic aneurysm, aortic regurgitation and even of angina pectoris and myocardial degeneration.

We are, therefore, face to face with the question of can and does such treatment cure or help. Statistics are rarely available. They are, moreover, in a case like this most uncertain. To state that aortitis was prevented in a given case is to indulge in a guess or the expression of a hope. It is not to state a fact. Yet impressions in medicine are worth something; experience counts. In a precocious luetic aortitis to find that under treatment pain goes, the murmurs are lost, etc., leads one to an optimism that seems well founded.

Perhaps I may express my own personal views by quoting with approval those of a recent French writer, Amblard,* though he is a little more dogmatic and optimistic than I am. The results of treatment of syphilitic aortitis are, he says, arrest, if not improvement in the valvular lesion—a statement endorsed by Vaquez—and of the dilatation of the aorta, the latter confirmed by x-ray examination. Furthermore, subjective symptoms such as dyspnea and pain are favorably modified. Notable changes in blood pressure are seldom seen. If these statements are only approximately correct, it behooves one in any case of syphilitic aortitis to treat the disease at as early a period as possible and in the most effective manner.

What is the best plan of treatment? Perhaps I am over cautious, even timid in the use of powerful drugs. They seem to me to be dangerous weapons, often two-edged, with power for evil as well as for good. Perhaps I am too much under the spell of the Herxheimer reaction and of Ehrlich's warning as to the use of salvarsan in cerebral and cardiac affections. Perhaps I have been unduly impressed by the tragic fate of several patients with whose histories I am familiar, who, after intensive arsenical treatment for aortic syphilis, promptly went wrong. Whatever the reason, I am accustomed to advise and to practice, beginning the treatment with moderate doses of mercury often with iodides, gradual increase in the doses of mercury and then the continuance of the mercurial and the use of some salvarsan preparation, starting with small doses. This seems to me the safer method. If I could assure myself that the process was recent and that the coronaries were not involved at their mouths or in their course, I would advocate the more intensive therapy.

Many good internists, neurologists, syphilologists and other clinicians disregard these precautions and attack syphilis vigorously as soon as it is recognized, not in the least disturbed by the possibility of an aortic or coronary localization. They obtain—in patients that survive—more immediate results, perhaps more nearly curative ones. Schottmueller may be regarded as representing their views. In an article published in January of this year (*Amer. Jour. of Syph.* IX; No. 1), he states that syphilitic aortitis should be grouped under curable diseases. "Intensive treatment is always indicated, never harmful." "Intensive treatment of aortitis aneurysmatica is both possible and harmless." In three conditions he advocates at first less intensive therapy. In women the initial dose of salvarsan is 0.3 gm. rather than 0.45 gm. as for men. If the syphilitic process has destroyed the major portion of the aortic wall, smaller doses are advisable. If there is accompanying syphilitic meningitis, one should work up gradually to arsenical treatment, beginning with mercury.

I have in this paper treated in a very casual manner some of the important features of aortic and cardiac syphilis—aneurysm, aortic valvular disease, syphilis of the coronary artery, and of the heart muscle. I have done this partly because of time limits, partly because these subjects are better known, but as well because I wished to preach to the text of the early recognition and early treatment of aortic syphilis. Difficult as this early recognition may be, impossible as it may be at times, it is what we should aim at. If we do this, fewer aneurysms, fewer aortic valvular lesions, fewer coronary complications will be the result of the disease.

A CASE OF INFANTILE DIABETES TREATED WITH INSULIN. Harold M. Bowcock and James A. Wood, Atlanta, Ga. (*Journal A. M. A.*, Jan. 9, 1926), report their experience with eighteen months' treatment of an infant in whom diabetes was discovered at 16 months of age. Diet regulation and administration of insulin constituted the treatment. The striking feature in this case has been the practically normal increase in height, in contrast to the stunting of growth that was observed in diabetic children before the advent of insulin. This case has been successfully managed without blood sugar determinations, but the authors do not recommend the disregard of this helpful adjunct to the control of treatment. Blood sugar readings have seemed valueless in this case because of the apparent lability of the metabolic processes in this child. There was frequently observed in from two to three hours time a change from a urine that was free of sugar and diacetic acid to a specimen loaded with both. Insulin reactions could be recognized only by objective symptoms, since the patient was unable to communicate his subjective feelings.

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* Amblard, L. A.: La Claquement Diastolique Aortique. Le Bulletin Medical. 39, No. 15, 11 Avril, 1925. p. 409.

SYMPTOMS OF URETERAL STRICTURE*

A STUDY OF ONE HUNDRED CASES, WITH A SYNOPSIS OF FIFTY CASES

Alexander Hamilton Peacock, M.D.
and
Raymond Fisher Hain, M.D.
SEATTLE, WASH.

Until a few years ago knowledge of lesions of the upper urinary tract was scarce. Their symptoms were unrecognized and unexplained. Patients with ureteral stricture have been submitted to repeated operations without relief from their symptoms. Many were given up as hopeless neurasthenics.

In spite of many doubters, Guy L. Hunner has written, practiced, taught and demonstrated obstruction of the ureter with his waxed bulb bougie. Urologists have visited his clinic in Baltimore, and others have attended his demonstrations of stricture in Boston, Philadelphia, Chicago, St. Louis and in the South. Many were skeptical, and some others still doubt the number he finds. We must admit, however, that he has done a great service for these patients in calling attention to this lesion. He has really given something to the profession.

The pathology of ureteral strictures, their symptoms, and treatment, are most interesting.

Pathology of the Ureteral Stricture. These changes observed in the ureteral wall are chiefly round cell infiltrations, as found in all inflammatory tissue. The median coat and epithelial lining are the principal layers involved. The epithelial cells become flat and plate-like. Usually edema is present, and sections of the stricture show some blanching. Palpation of the stricture gives a sensation of hardness, and thickening of the ureter. In two cases of this study, this hardness was so pronounced that it felt like impacted calculi. At times there is a marked periureteral thickening. This is particularly true of strictures near the intramural portion of the ureter.

Infection of the ureter occurs in two ways: One, by bacteria regurgitating up the ureter, as in chronic cystitis (these are chiefly tuberculous), or descending the ureter, as in a pyelitis. At one time the gonococcus was thought to play an important role in strictures of the ureter. Many animal experiments have disproved this method as an important causative factor.

Second, from foci of infection in other parts of the body, as the tonsils, teeth, endometrium, fallopian tubes and seminal vesicles. The median coat of the ureter is rich in lymphatics, and has been well studied by means of dyes. The lymphatics of the ureter readily convey the infection along its length, producing localized areas of infection. These are particularly common in women with their frequent pelvic infections. That portion of the ureter running through the broad ligament is a very common location for a stricture. It is this segment of the ureter where Hunner has found most of his strictures. Further, the incident of stricture is far greater in women than in men, relatively few being found in the latter.

Calculi of the ureter frequently accompany strictures. The earlier writers gave it as their opinion that the calculi were primary, and the strictures were caused by irritation. More recently Cabot and Hunner advanced the theory that the stricture was primary, that a deposit of urinary salts occurred and ultimately a stone was formed. Both processes probably occur.

Symptoms of Ureteral Stricture. The paramount interest of strictures is the symptoms. These are quite diversified, but as a whole have general characteristics, such as ureteral colic, simulating calculus, tendernes over the ureter or kidney, and the history of an infection located somewhere in the body. More can be learned from the actual cases than by summarizing.

The final diagnosis in this series was made by uretergrams and obstructions to the ureteral catheter. Some of the female cases were checked up with the wax bulbed bougie.

Case 1, No. 7502. The patient is a male, thirty-seven years old. He gave a history of multiple arthritis. His admitting compaint was frequency of urination, and at times pyuria. A stricture was found in the left ureter one centimeter below the pelvis.

Case 2, No. 7495. The patient is a male, thirty-three years old. He gave a history of typhoid fever, suppurative appendicitis, infection from herniotomy, a mild attack of influenza, arthritis of the right knee and mild pyuria. Right ureteral strictures were found at fifteen and twenty-two centimeters from the bladder; on the left side there was a stricture twenty centimeters from the bladder.

Case 3, No. 7446. This patient is a female, twenty-seven years old. She has a history of influenza, mumps, diphtheria and appendicitis. The patient developed colicky pains in the left groin and back, radiating into the groin. A diagnosis was made of renal calculus. The urine was negative for bacteria. A tight stricture was found two centimeters below the left pelvis. She was entirely relieved by dilatation.

Case 4, No. 7350. The patient is a female, thirty-one years old, who gives a history of scarlet fever, followed by a mastoiditis, inflammatory rheumatism with endocarditis, influenza with pleurisy. The symptoms at the time of the examination were considerable backache, and the feeling of pressure in the lower abdominal region, intense pain in the left hip and gastric distress. Cholecystectomy was performed, removing an inflammatory gallbladder full of stones. This operation did not relieve her pains. An obstruction was found in the left ureter, fifteen centimeters from the bladder. Three dilatations entirely relieved this woman of her symptoms.

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* Read before the Fifty-first Annual Meeting of Oregon State Medical Society, Medford, Ore., Sept. 2-4, 1925.

Case 5, No. 7320. This patient is a female, thirty-seven years old. She gave a history of the usual childhood diseases, pneumonia eight years previous to her present examination, infected tonsils and appendectomy later. She had a great many attacks of pain in the right kidney region, with right-sided colic, which were followed by prostration. She was entirely relieved by six dilatations.

Case 6, No. 7289. The patient is a female, twenty-two years old. Her history of infections were tonsillitis at eleven years of age, influenza at nineteen, and appendectomy at twenty-one years of age. Following her influenza she had a severe left-sided backache with pronounced pyelitis, and she had been suffering for two years with these symptoms. At one time streptococci were found in the urine. She had typical attacks of pyelitis, chills and fever, with colic. A stricture of the left ureter was found twenty centimeters from the bladder. The urine contained occasional blood cells, and bacilli resembling B. coli. This patient died four years later of pulmonary tuberculosis.

Case 7. No. 7195. This patient is a male, forty-four years old. His only infection was jaundice. Five days previous to his examination he had had a severe attack of left-sided colic, radiating into the left testicle. This attack lasted forty-five minutes. He had a second attack two days later, the pain radiating into the left kidney. These attacks were very severe. A stricture was found in the intramural portion of the left ureter. This was dilated to No. 9 French. A mild hydronephrosis existed. The patient was entirely relieved.

Case 8, No. 7391. The patient is a male, forty-eight years old. He gave a history of two attacks of arthritis in the ankles, elbows and knees; and scarlet fever five years previous to his examination. Two days before his present illness he had a severe attack of colic in the lower right abdomen, sudden onset. A stricture was found in the right ureter, fifteen centimeters from the bladder. This patient was entirely relieved by two dilatations under general anesthetic.

Case 9, No. 7142. The patient is a male, twenty-five years old. His only infection was pneumonia. At the time of his examination he had pain in the left inguinal region which radiated into the left testicle and the small of the back. A stricture of both ureters was found. The one on the left side was ten centimeters from the bladder, the one on the right fifteen centimeters.

Case 10. No. 7370. This patient is also a male, twenty-five years old. His previous infections were pneumonia, influenza, an infected left ear following the pneumonia and convulsions one year ago. He had his first attack of pain three years previously in the region of the left kidney, and it lasted thirty minutes. Two weeks ago he had another attack which lasted two hours. The pain radiated into the left testicle. A stricture was found in the left ureter, just below the pelvis.

Case 11, No. 11122. This man, thirty-nine years old, gave a history of pneumonia at twenty-eight years of age, chronic tonsillitis, appendicitis and ulcer of the stomach. For the past year he had had pain in the lower abdomen, gradual onset. The pain shot up into the back and there was a considerable sense of soreness. An obstruction was found in the right ureter fifteen centimeters from the bladder. The ureterogram showed a stricture and a kink at this point. This patient was entirely relieved by dilatation.

Case 12, No. 11136. The patient is a female, thirty-three years old. Her medical history was hard to obtain on account of her nationality, Japanese. She has had bladder trouble for the past twelve years, hematuria at times, and pain and tenderness in the small of the back, near the right kidney. A stricture was found in the intramural portion of the right ureter. A No. 4 catheter was passed with difficulty. The jelly-like material obtained from the right kidney suggested filariasis.

Case 13, No. 11233. This patient, a female thirty-five years old, gave a history of right facial neuritis with paralysis. Three weeks ago she noticed a mild hematuria, no pain. There were a number of red blood cells in the urine. Renal study showed a papilloma of the bladder, a bilateral pyelitis, and a stricture in the intramural portion of the right ureter, which only admitted a No. 4 catheter.

Case 14, No. 11236. This patient is a male, forty-two years old. He gave a history of acute appendicitis at thirty-four years, and a year before his present examination osteo-ostitis of the right sacroiliac. His chief complaint was a pain in the right hip of three years duration. A renal study showed a pin point ureteral orifice with a stricture ten centimeters from the bladder. The patient was relieved was dilatation.

Case 15, No. 11238. The patient is a female, twenty-nine years old. At twenty-two years of age she had pneumonia, followed by influenza; she was very ill. Three years before that time she had had appendicitis, also an attack of pyelitis, following pregnancy. A renal study showed a stricture of the right ureter twenty centimeters from the bladder, and one in the left ureter one centimeter from the bladder. Both of the kidney urines contained B. coli. The patient was relieved by dilatation and a lavage with silver nitrate solution.

Case 16, No. 11309. This patient is a female, fifty-one years of age. She had scarlet fever as a child, and chronic tonsillitis and influenza in 1920. Her symptoms were attacks of severe pain in the left kidney region, from a dull ache to a radiating pain. The urine was almost clear. A renal study showed a stricture of the left ureter ten centimeters from the bladder. The ureterogram shows a dilation of the ureter above this point.

Case 17, No. 11334. This is a male patient, fifty-two years old, who gave a medical history of suppurative appendicitis with drainage ten years previously. For six months before his examination he had had pain in the upper right abdomen. This pain was very vague, traveling from the left to the right side, sometimes in the back, sometimes in the gallbladder region. He had had hematuria, and there had been tenderness along the course of the right ureter. There was a difference of opinion on the diagnosis, and a catarrhal gallbladder was removed. The patient was not relieved. A renal study showed a stricture in the right ureter fifteen centimeters from the bladder. A ureterogram showed a dilated ureter above this point, with hydronephrosis.

Case 18, No. 11413. The patient is a female, twenty-three years old. She gave a history of chronic tonsillitis, ruptured appendix, followed by abscess formation and adhesions. She complained of an ache in the right abdomen. This pain runs into the right thigh and right ilium, and lasts from a few minutes to a few hours. She is relieved by emptying the bladder. An obstruction of the right ureter was found ten centimeters from the bladder. A No. 5 catheter was passed with difficulty, and dilated up to No. 9 and No. 11 French. The pain of this dilatation was the same as her chief complaint.

Case 19, No. 10915. The patient is a female, twenty-two years of age. She was sickly as a child, with all the eruptive fevers, influenza in 1919, with chronic tonsillitis, appendectomy and a left salpingectomy. Her pains were not relieved. She had had leftsided pain with colic for seven years; it came on every two or three weeks and lasted from two to five hours. These pains are often severe enough to throw her into convulsions. The urologic examination revealed a stricture of the left ureter two centimeters from the bladder. There was none in the right ureter. After the ninth dilatation she had complete relief.

Case 20, No. 11432. The patient is a female, forty-eight years old, who gave a medical history of tonsillitis, appendicitis and salpingitis. She was operated on for all of these. She also had a number of infected teeth which were removed. Her symptoms were frequency of urination and irritability of the bladder. She also had hematuria, and there has been a dull ache in the right side. Examination showed an obstruction in the right ureter ten centimeters from the bladder, which was passed with difficulty.

Case 21. This patient is a male, fifty-eight years old. His past infections were typhoid fever, long standing arthritis, with gallbladder disease. He had had his first attack of rightsided colic twenty-five years previous to his present examination, and his last one just two days before, with a mild hematuria. The examination revealed an obstruction of the right ureter fifteen centimeters from the bladder, which was passed with a No. 6 French catheter. The urine from the right kidney showed staphylococci.

Case 22, No. 7967. The patient is a male, thirty-four years of age. His past infections were smallpox in 1916 and influenza. In 1918 he had a bladder stone removed, in 1920 hemorrhoidectomy. Examination revealed a chronic prostatitis, with strictures of both ureters, twenty centimeters from the bladder. He also had pains in the lumbar portion of the back, especially near the left hip, a dull ache for a day or two, and then it would leave. The patient was relieved by dilatation.

Case 23, No. 11105. The patient is a male, thirty-one years old. He had chronic tonsillitis as a child, appendectomy in 1918, left nephrolithotomy in 1922, right ureterolithotomy in 1923. He had a dull pain in the left kidney region. Examination revealed a stricture of the right ureter five centimeters from the bladder. This apparently was in the site of the impacted calculus. B coli, pyelitis, bilateral, were present.

Case 24, No. 20592. This patient is a male, twenty-six years old. No history of previous infection was ascertained because the patient was Japanese. Three days before his examination he had an attack of right sided colic, severe. Since that time the pain had remained in the small of his back, radiating to the right groin. There were red blood cells in the urine. Examination revealed an impacted calculus in the ureter at the brim of the pelvis. This was removed by extraperitoneal ureterolithotomy. The walls of the ureter at this point were greatly thickened for a distance of four centimeters. This demonstrated very readily the pathology of ureteral stricture. Apparently the calculi in this case were a secondary formation.

Case 25, No. 10851. The patient is a female, twenty-five years old. As past infections she gave a history of chronic tonsillitis, influenza in 1918. Following her influenza she had a streptococcic infection of the bladder. A stricture of the right ureter was located five centimeters from the bladder, and has been dilated since that time, with complete relief for the patient.

Case 26, No. 10761. The patient is a female, twenty-six years old. The only past infection recorded is influenza ten years previous to her examination. She had repeated attacks of left-sided colic. Examination revealed an impassable stricture three centimeters from the bladder. A ureterogram demonstrated nicely a stricture at this point, with dilation above it. The patient also had a tuberculous left kidney, and a left renal calculus. This one is included on account of the well known tendency of the tubercle bacilli to form a stricture of the ureter. Nephrectomy relieved this patient of her troubles.

Case 27, No. 10742. This patient is a male, twenty-four years of age. In Russia he had had a severe attack of typhus. Following this infection he had pain in the left kidney lasting a week, and more or less soreness ever since. He was hysterical and in great agony when I first saw him. Renal study located a stricture in the left ureter three centimeters from the bladder, which was finally passed with a No. 5 catheter. He was entirely relieved by dilatation.

Case 28, No. 10682. The patient is a male, forty years old. He gave a medical history of typhoid fever in 1913 and chronic infection of the teeth. These were extracted in 1922. For two months he had had repeated attacks of right-sided colic, lasting several hours, also frequency of urination. Renal study located a stricture two and one-half centimeters from the bladder. This was impassable. A pyelogram showed the stricture at this point with spindle-like dilation above it.

Case 29, No. 10615. The patient is a female, sixty years old. One year ago a malignant papilloma was removed, followed by deep x-ray therapy, also ulceration of the cervix. Chronic infection of the cervix is one of the commonest causes of the stricture of the ureter, carrying infection through the broad ligaments. Two days before her examination she had severe right-sided pain in the abdomen and right labia, accompanied with frequency of urination. This lasted about four hours. A renal study located a stricture of the right ureter fifteen centimeters from the bladder, with thirty cubic centimeters of retained urine. A ureterogram demonstrated a spindle-like stricture at the junction of the lower and middle third of the right ureter.

Case 30, No. 10383. The patient is a male, thirty-five years old. His past medical history was chronic tonsillitis and influenza. A year before his examination he had twenty-seven attacks of right-sided renal pain. No calculus or blood passed. These attacks lasted from fifteen minutes to four hours. Always the pain started in the region of the kidney and finally worked down toward the bladder. Renal study revealed a stricture in the intramural portion of the right ureter. This was passed. The ureterogram shows a spindle dilation above this point.

Case 31, No. 10160. The patient is a male, forty-one years old. No infections were located, but he did have an injury to his left side, by colliding with a streetcar six years before. A month before his examination he was awakened during the night by a severe attack of pain in the left kidney region. This lasted two hours. Since that time he has had three attacks. These are severe enough to require morphine. The pain radiated into the left hip. Renal study revealed a stricture of the left ureter eleven centimeters from the bladder. This stricture was very tight. After four dilatations all his symptoms disappeared, and he has been relieved of pain. This type of stricture was fibrous. They dilate but little.

Case 32, No. 10118. The patient is a little girl, two years old. There is no history of infection. The baby had had frequent urination for two months. She ran a temperature now and then to 102°, with chills. A renal study showed a stricture of the right ureter one centimeter from the bladder. A ureterogram showed a spindle ureter and a stricture.

Case 33, No. 9946. This patient is a female, twenty-eight years old. She gave a medical history of the eruptive fevers of childhood, including scarlet fever. Appendectomy in 1915, then three months later bilateral salpingectomy. In 1919 she was operated on for abdominal adhesions. The same year she had a tonsillectomy and the amputation of the cervix. She had tuberculosis of the left hip at nineteen, which was curetted. The past five years she had had frequent and painful urination, passing blood at times. A renal study revealed a stricture of the right ureter five centimeters from the bladder.

Case 34, No. 9125. The patient is a male, thirty years old. His only infections were diphtheria at twelve and influenza in 1919. For six years he had attacks of left-sided colic, very severe, radiating into the left testicle, accompanied by burning urination. Several of these attacks were accompanied by hematuria, and calculus was suspected. Renal study showed a stricture of the left ureter six centimeters from the bladder. This stricture was not dilatable by the intravesical route, so an extraperitoneal exposure was made of the ureter and it was dilated by the retrograde method. The patient made a complete recovery. Before this dilatation he had been a semi-invalid.

Case 35, No. 9031. The patient is a male, twenty-seven years old. His only previous infection was influenza in 1918. Five months before his present examination there was a pain in the left side near the kidney, of sudden onset, and lasting three days. He has had several attacks since then, accompanied by nausea, vomiting and hematuria. In three months time he lost twenty pounds. A renal study showed an obstruction of the left ureter five centimeters from the bladder. A No. 4 catheter was passed. A ureterogram shows this stricture very plainly.

Case 36, No. 9066. This patient is a male, forty-four years old. As past infections he had the measles, mumps, diphtheria, anterior poliomyelitis, influenza in 1922 and, last, primary syphilis. His symptoms were frequency of urination for the past few months, and burning in the bladder. Three months ago he was taken with severe chills. The urine had been cloudy. An impassable stricture of the right ureter half a centimeter from the bladder was found.

Case 37, No. 9073. This patient is a male, fifty-nine years old. He gave a past medical history of fistula in ano. His symptoms were pain in the lower abdomen five days prior to his present examination. These pains were dull in character, constant, and did not radiate. The pain then became very severe and cramp-like, and radiated to the left kidney. These attacks came on very frequently. A pyelogram showed an obstruction six centimeters from the left orifice. After this calculus was removed a fibrous stricture was located six centimeters from the bladder. This also was demonstrated by ureterograms. He has been dilated a number of times since then. Now he is free of pain, although the stricture will not stay wide open.

Case 38, No. 8592. This patient is a male, fifty-eight years old. As previous infections he had the eruptive fevers of childhood. His symptoms were cramp-like in the region of the left kidney, which lasted four days. They were referred along the course of the left ureter to the testicle and thigh. The pain was only kept under control by morphia. A clinical diagnosis was made of impacted stone, and the ureter was exposed by extraperitoneal method. The ureter was tortuous, soft, and filled with urine. It was under great pressure. A fibrous stricture was found in the intramural portion of the ureter. Later this same ureter was dilated and the patient had complete relief. There were very marked clinical symptoms of obstruction. No stone was present.

Case 39, No. 10863. This patient is a female, thirty-three years of age, who had seven attacks of pain in the left kidney, with hematuria. This pain was very severe, and was only relieved by the use of a narcotic. An impacted calculus was located in the right ureter ten centimeters from the bladder. This was removed by ureterolithotomy, but the patient was not relieved of her symptoms. An impassable stricture was found eight centimeters from the bladder. A nephrectomy was performed and the patient is now perfectly well.

Case 40, No. 8495. This patient is a male, forty-two years old. No infection was noted. He was taken six days ago with pain in the lower right abdomen, accompanied by rectal and vesical tenesmus. The pain has come on every six or eight hours since that time. There is blood in the urine. A renal study revealed a stricture of the ureter five centimeters from the bladder. This was dilated up to No. 11 French. Following this manipulation the patient had complete relief, and has had no further attacks.

Case 41, No. 8375. This patient is a male, twenty-nine years old. His previous infections were appendicitis in 1912, with operation; in 1921 a gall-bladder drainage. His symptoms first came on in 1912, with a sudden onset of pain in the region of the right kidney. He has had a number of attacks since. They last from a few minutes to twenty-four hours. The most intense pain is at the crest of the ilium. It feels like something sticking into him. He vomits and doubles up with pain. Renal study showed a stricture of the right ureter twenty-two centimeters from the bladder.

Case 42, No. 8362. The patient is a female, twenty-two years of age. Her previous infections were measles, mumps, scarlet fever, whooping cough and malaria. She also had a very difficult instrumental labor and was ill for seven months afterwards. Her symptoms were pain in the region of the right groin and kidney for the past year. She has frequency with burning and tenesmus, no hematuria. She has lost twenty pounds. Renal study revealed an impassable stricture of the right ureter two centimeters from the bladder. At a later date, under general anesthesia, this stricture was dilated up to No. 11 French, and the patient has regained her lost weight and is entirely relieved.

Case 43, No. 8310. The patient is a male, forty-two years old. His previous infections were measles, mumps, chickenpox, whooping cough and influenza. Two days prior to this examination he was taken with sudden severe cramps in the region of the left kidney. This was diagnosed colic. The pain was very severe. There was an obstruction fifteen centimeters from the left orifice. This was dilated up to No. 11 French, and all the symptoms cleared up promptly.

Case 44, No. 8297. This patient is a male, forty-one years old. He gave a medical history of measles, mumps, scarlet fever, whooping cough. He has had a backache for the past seven months, especially in the right side, with pain and soreness in the right groin, the right sacrolumbar region and over the right kidney. Renal catheterization shows an obstruction of the right ureter fifteen centimeters from the bladder. He was relieved by dilatation.

Case 45, No. 8254. The patient is a female, thirty years old. Her only previous infection was appendicitis five years before. The past ten years she suffered a dull ache across the small of her back. Two years ago she had an acute pain in the right side of the lower abdomen, radiating toward the pelvis, lasting two hours, and relieved by voiding urine. Hematuria lasted several days. The patient was weak and undernourished. Urologic study revealed bilateral ureteral stricture with hydroureters and pyelitis. When the obstruction was passed five centimeters from the bladder, she had immediate relief from her pain in the right side and kidney. This patient has been dilated a number of times, always with relief of her pains.

Case 46, No. 7929. This patient is a female, eighteen years old. Her previous infections were appendicitis and the eruptive fevers of childhood. Her symptoms were mild attacks of right-sided colic, covering a period of two years. This colic lasted several hours. A renal study revealed a stricture of the right ureter at the ureteropelvic junction. This was entirely relieved by dilatation.

Case 47, No. 7789. The patient is a female, nineteen years old. Her previous infections were scarlet fever, measles, whooping cough, influenza with pneumonia, chronic tonsillitis with arthritis of the knee and cystitis. Her symptoms were pain in the left kidney region, which radiated into the left groin. She had attacks every week, lasting four to six days. There was considerable pain in the back which was made worse by exertion, and was so severe that she was unable to do her work. This pain finally became constant and she suffered even while lying in bed. Renal study located a stricture of the left ureter one centimeter from the orifice. This was dilated to No. 11 French. After three dilations she was entirely relieved of her symptoms.

Case 48, No. 7726. The patient was a female, twenty-two years old. No infections were recorded. For two and one-half years this patient had been a semi-invalid on account of severe pain in the left side of the abdomen. Most of the time it was a dull ache and then it would become colicky. There was no nausea or vomiting, and never any fever. Many diagnoses were made. Examination showed large infected tonsils. She was submitted to operation and the tonsils were removed, also a large appendix. The patient was then cystoscoped and a stricture was found in each ureter. On the right side it was fifteen centimeters, on the left side twenty centimeters from the bladder. Three dilatations entirely relieved her of her pain.

Case 49, No. 8152. The patient is a male forty-three years old. He gave a medical history of appendicitis, acute, and fifteen years previously he had had a gonorrheal infection of the left epididymis and arthritis. Three years ago pain came on in the region of the left kidney, colicky in nature. These attacks of pain greatly incapacitiated him from his work. Examination showed chronic infection of the seminal vesicles. Catheterization of the ureters showed a tight stricture of the left ureter in the intramural portion. This was dilated. A year later this patient reported himself in excellent condition, and entirely relieved of his symptoms.

Case 50, No. 8104. The patient is a male twenty-two years old, who gave a history of smallpox, measles, and influenza of a severe type three years previously. A year later three calculi were removed from the right ureter. Six months later appendectomy was performed. He had ten operations on his right leg on account of a bullet wound received June twenty-third, 1918, at Belleau Woods. In other words this patient gives a history of chronic infection. He had no urinary symptoms, but there was a dull ache in the region of the right kidney, no colic. The urine is clear. Renal study revealed a stricture of the right ureter, six centimeters from the bladder. After three dilatations this patient was entirely relieved of his symptoms.

SUMMARY

In summing up we are impressed by the following observations:

1. There is a wide diversity of symptoms of patients suffering with ureteral stricture.

2. They may resemble stone in the ureter, pyelitis, sacroiliac disease, intestinal adhesions and appendicitis.

3. Note the relative frequency of ureteral stricture and its increasing recognition by the general surgeon and practitioner.

4. Right sided pain, first diagnosed chronic appendicitis, should be investigated further by means of renal study.

5. Stricture, complicated with calculus, is frequently fibrous in character and not dilatable. These require cutting of the stricture, as done in ureterolithotomy, or nephrectomy, where the obstruction cannot be kept open.

THE RECOGNITION AND TREATMENT OF URINARY INFECTION*

William F. Braasch, M.D.
ROCHESTER, MINN.
Section on Urology, Mayo Clinic

I shall discuss here only some of the more recent advances in urinary infection and the treatment of various types of the disease.

It was formerly believed that renal infection was always ascending. Later the pendulum swung to the viewpoint that such infection was always descending. Recently we have modified our viewpoint, since we have come to know that most cases of renal infection are of the descending type, but that there is also a definite type that is ascending.

Graves, working with Quinby, has shown by animal experimentation that with a full bladder ureteral peristalsis may be so diminished that the urine may ascend from the bladder up the ureter as far as the renal pelvis. It can be readily inferred that, if the urine is infected, bacteria could ascend to the kidney in this manner and infect it secondarily. I am under the impression that in many cases of distended bladder secondary to prostatic obstruction, pyelonephritis results from the infection in the bladder, because of weakening of the ureteral peristalsis by long standing back pressure, particularly if catheterization has been intermittent.

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We are all familiar with the type of cystitis secondary to acute urethritis, in which only the portion of the bladder adjacent to the prostatic urethra becomes inflamed. Occasionally such an infection may involve the entire bladder, apparently ascend the ureter, and infect the kidney secondarily. Fortunately, however, in most cases the infection is localized to the trigone and usually disappears with improvement in the condition of the urethra.

Ascending infection, frequent in the female, occurs with chronic urethritis or relaxation of the urethra. As a result of relaxation, infection easily passes from the urethra into the adjacent bladder mucosa. This type of infection explains a large number of cases of so-called irritable bladder, in which very little can be seen on cystoscopic examination, other than slight congestion of the mucosa.

However, most cases of infection in the urinary tract are of the descending or hematogenous type. Most cases of so-called cystitis have had their origin in some distant focus of infection, the infection being carried to the bladder by the blood stream and the kidney. The kidney itself may be but slightly affected and may rapidly become normal, while the infection in the bladder may persist and become chronic. At examination some time after the original infection, there may be no evidence of disease in the kidney, which probably explains a great many cases of recurring attacks of cystitis. The patient may have symptoms lasting several weeks, followed by their disappearance and reappearance for varying intervals.

Many cases of recurring urinary infection are undoubtedly due to focal infection and the patient should be carefully examined for possible evidence of such focus. This means, of course, a careful roentgen-ray examination of the mouth, even if all the teeth may have been extracted, and examination of the nose and throat, even if tonsils and adenoids have been removed. It is not unusual for patients to say that all their teeth are out, and yet for the roentgenogram to reveal the presence of a number of infected roots. Similarly, the patient may give a history of a previous tonsillectomy and careful examination disclose a septic tag which had not been removed. It is not at all unusual to have a patient claim that he has not had trouble with his throat, and then to find he has septic tonsils. The tonsils need not necessarily be large; small tonsils containing plugs of pus may be more virulent than large ones. It is true that sometimes tonsils and devitalized teeth will be sacrificed needlessly, but it may be impossible to distinguish between the guilty and the innocent and, in order to insure removal of all foci, tonsils and teeth must be removed, if they show any evidence of infection. Von Lackum has shown that chronic pyelonephritis as well as infection in various distant tissues and organs may be the result of a focus of infection in chronic prostatitis.

A comparatively common type of renal infection is characterized by single or multiple small cortical or subcapsular abscesses, and may produce but few, if any, urinary symptoms; its true nature is, therefore, easily overlooked. On reviewing the patient's history, there is almost always a recent definite attack of some form of skin infection which the patient may refer to as a boil or carbuncle. Subsequent to this the patient may have a sudden chill with fever and malaise and possibly, although not always, a dull ache referred to the area of the kidney. The fever may persist for weeks, without any other definite clinical data. Microscopic examination of the urine may reveal only a few pus cells or none. Tenderness over the kidney is usually of little practical value, and roentgen-ray and cystoscopic data are, as a rule, not of much practical importance in diagnosis. In a few cases, however, when the abscess has extended toward the medullary portion of the kidney, there may be deformity of the renal pelvis visible in the pyelogram, together with reduction in the renal function. However, in most cases the clinical data will be obscure and after excluding the involvement of other organs, the history of a recent skin infection or a carbuncle is of the greatest importance. Needless to say, in cases of doubt it is advisable to explore the kidney and, if an abscess is found, to drain it. On exploration there is usually secondary perinephritis involvement. The abscess in the kidney itself is often very small, situated under the capsule and difficult to locate. This explains why there is frequently no bulging or marked tenderness in the area of the kidney. Drainage affords relief. There rarely are multiple areas of cortical infection in this type of case.

The so-called septic cortical nephritis described by Brewer is, for some reason, not seen nearly so often as formerly. This is described as being of hematogenous origin and is characterized by multiple cortical abscesses. The only renal infections of this type which I have observed in recent years have appeared subsequent to pyelography and were caused by obstruction of the renal tubules with the pyelographic medium or by the secondary irritation it caused.

The existence of so-called pyelitis of pregnancy is now being recognized more frequently. This condition doubtless explains the fever which occurs during pregnancy and which formerly could not be accounted for. The exact etiologic factors involved in such cases have not been definitely determined. Many observers have come to the conclusion that it is secondary to pressure on the ureter by the fetus. As the result of interference with urinary drainage the secondary infection is probably of hematogenous origin or the descending type. This condition can easily be relieved by introducing ureteral catheters to the renal pelvis and allowing them to remain for several hours, or in some cases for a day or two, but as a rule one or two catheterizations will remedy the trouble.

In the treatment of urinary infection it is of considerable importance to know whether the urine is acid or alkaline. An important point in the diagnosis of urinary infection is never to be satisfied with the examination of specimens of urine passed by the female. A wrong diagnosis of urinary infection will often be made in this way. The possibility of extravesical contamination is considerable. It is not unusual to find 100 pus cells to the field in the passed specimen, and none at all in the catheterized specimen. Thus it is of fundamental importance to have a catheterized specimen in every case. This is not so much for the purpose of obtaining the reaction of the urine as to obtain the urine from the bladder uncontaminated. If the urine is alkaline, either retention or alkaline phosphatic cystitis is present. While retention may be either in the bladder or in the ureter and renal pelvis, in most cases it is in the bladder. Vesical retention may be due either to prostatic obstruction or disease in the spinal column. It should be remembered that, even though no evidence of prostatic enlargement is found on rectal examination, there may be marked prostatic obstruction protruding into the bladder. Urinary retention with a negative rectal examination is often caused by disease of the nerves supplying the bladder and may be the only evidence of a lesion in the central nervous system. Marked alkaline reaction of the urine, therefore, is evidence of either retention or alkaline phosphatic cystitis. The latter being excluded, the retention is due either to prostatic and urethral obstruction or to a lesion in the cord. The urine may also be alkaline in the presence of stones or malignant tumor in the bladder. There is either urinary retention with these conditions or an invasion by a secondary organism which has the power of making the urine alkaline.

Alkaline phosphatic cystitis comes under this group and, although not a common disease, is frequently very misleading. It is usually characterized by hematuria, ulcerative cystitis and granulomas, which may be easily confused with neoplasm. It can be controlled by acidification of the urine and topical applications of silver nitrate. That it is caused by a specific organism has been shown recently by Hager and Magath. Although Rosenow has shown that bacilli are a factor in stone formation, this is the first example in which a direct cause has been definitely observed.

If the urine containing pus is acid and if on culture no bacteria are seen, the possibility of tuberculosis must be considered. While other types of infection may be present with acid urine and sterile culture, this is nevertheless quite characteristic of renal tuberculosis. The vesical involvement with renal tuberculosis is usually so severe as to cause considerable dysuria. Rarely do these patients sleep throughout the night. Therefore, with a history in the adult of pus in the urine, frequency, urine acid in reaction and bacteria-free on culture, renal tuberculosis is the strongest possibility. The exact diagnosis is made, of course, by finding acid-fast bacilli in the urine, in much the same manner as we examine the sputum, and should be found in 75 per cent of the cases.

In cases of bilateral pyelonephritis the urine is usually acid, but on culture bacteria are always found and *Bacillus coli* usually. Bilateral pyelonephritis is undoubtedly a much more common disease than was formerly believed. The urinary frequency and dysuria are often as marked as in cases of renal tuberculosis. The differential diagnosis depends largely on whether the bacilli of tuberculosis are found in the urinary sediment and on whether a deformity is seen in the pyelogram. When pyelonephritis has persisted for many years, it is eradicated with difficulty. It is my custom to inform the patient suffering from this disease that one-third of the patients gets well following treatment; one-third is markedly improved, and the remaining one-third is not helped by present methods of treatment. The treatment today consists of, first, removal of all possible foci of infection; second, internal medication, such as hexamethylenamin and ammonium chlorid hexylresorcinol and forced fluids; third, local treatment, such as vesical irrigations and lavage of the renal pelvis, and dilatation of strictures; and, fourth, intravenous medication with hexamethylenamin, mercurochrome and acriflavin.

As previously stated, one cannot look too carefully for possible foci of infection in these cases, and anything which could possibly act as a focus should be removed. Lavage of the bladder and of the renal pelvis has unquestionably given much symptomatic relief and has been of more or less permanent benefit to the patient. It is our custom to inject 5 to 10 c.c. of silver nitrate into the pelvis of the kidney with the patient in the Trendelenburg position, and allow it to remain in the pelvis for at least five minutes by plugging the catheter.

Hunner has called attention to the possibility of stricture in the ureter as a factor in such infections. Ureteral dilatation is frequently seen in the urogram and may be explained as the result of both mechanical and inflammatory dilatation. That strictures are common with pyelonephritis must be recognized, and in these cases it is well to dilate the ureter thoroughly. How permanent the relief may be from such dilatation is open to question in many cases.

Internal medication has not been very efficacious. Hexamethylenamin has been largely discarded in such conditions because it is of value only in acid mediums. More recently its use has been revived in conjunction with ammonium chlorid, which acidifies the urine more effectively than any other drug. Leonard has shown recently that in vitro hexylresorcinol is probably the most powerful urinary antiseptic, to be taken internally, yet advocated. The drug has, unfortunately, received such newspaper notoriety that the laity, as well as the medical profession, have been led to believe that it is efficacious in all urinary infections. Unfortunately, it has not proved to be of such value in vivo as had been hoped for. Leonard has stated that it is more efficacious as a urinary antiseptic than as a renal antiseptic. Since chronic pyelonephritis is a disease affecting the parenchyma of the kidney, it would hardly come within the province of this drug. Clinical experience has failed to show many cases of pyelonephritis in which hexylresorcinol has succeeded in removing all the infection. It has been my experience in a few cases of pyelonephritis, that some symptomatic relief resulted after large doses of hexylresorcinol had been given over a long period of time. However, the value of this remedy has been greatly exaggerated; it has been effective in but few cases of chronic infection of the urinary tract.

Intravenous medication in cases of urinary infection has received a marked impetus since the use of intravenous mercurochrome was begun. As a result of unfortunate notoriety in both lay and medical press, many general practitioners are using intravenous mercurochrome promiscuously and without a careful study of its indications and contraindications. There is no doubt that in some cases of sepsis cures following the use of intravenous mercurochrome have been almost miraculous. It should be remembered, however, that it is not without danger when used intravenously and should be employed only as a last resort and then only with the greatest precautions. It has been our experience that it is of the greatest value in acute, rather than chronic infections. Furthermore, it is of particular value in acute infections of the urinary tract that have not responded to the usual treatment. It is seldom of any value in chronic infections and is, therefore, of little benefit in chronic pyelonephritis.

The intravenous injection of gentian violet has been of little aid in combatting urinary infection, even though coccal infection is present. Intravenous injections of acriflavin have also not been of much aid. In persistent acute pyelonephritis, I have found that daily intravenous injection of 5 c.c. of urotone containing five per cent hexamethylenamin is frequently of value, and it has the additional advantage of not causing reaction. In some acute cases of pyelonephritis I have also found that considerable temporary benefit may be derived from intravenous injection of Fischer's solution.

Stricture of the ureter resulting from infection in the ureter has recently been the subject of much discussion. It was formerly thought that ureteral stricture rarely occurred except as secondary to renal tuberculosis. Largely owing to the investigation of Hunner, it is now recognized that ureteral stricture is more common than we had previously believed, although but few urologists agree with him as to its frequency. Hunner believes that it is comparatively common, particularly in females, and that it is a common cause of obscure abdominal pain and distress. He claims that the ureteral stricture can be diagnosed by introducing a catheter bearing a wax bulb into the ureter and ascertaining the existence of a so-called hang on withdrawing the bulb. This evidence is not generally accepted as being sufficient to make a definite diagnosis. It would be only logical to assume that, if there were a stricture in the ureter, there would be dilatation immediately about it. In order to demonstrate this clinically, it is necessary to make a urogram. Unfortunately, however, the normal ureter is distensible and when overdistended there may appear to be slight dilatation in the ureterogram. Consequently, minor degrees of apparent dilatation are interpreted differently by various observers. It has been my experience that, in order to make a diagnosis of ureteral stricture, there must be undisputed dilatation in the portion of the ureter above the stricture, together with some evidence of pyelectasis.

Whether such strictures can always be cured by dilatation has not been conclusively demonstrated. There is no doubt that many observers are ascribing vague abdominal complaints to so-called stricture of the ureter and subjecting the patient to needless dilatation when no stricture exists. On the other hand, when dilatation of the ureter has been demonstrated resulting from stricture, as occurs with chronic pyelonephritis, ureteral dilatation has proved of definite value.

Hunner has also recently called attention to an obscure type of areal cystitis which he has termed "elusive ulcer." This is characterized by a slight superficial erosion of the bladder mucosa, together with marked submucous infiltration and induration. Such ulcers, when they occur singly and when there are no other areas of infection in the urinary tract, may be resected with at least temporary relief, as Hunner described. However, as this clinical entity is not common, many types of inflammation and ulceration of the bladder are being confused with the elusive ulcer, and patients subjected to needless surgical treatment. Multiple simple, superficial ulcers of the bladder are much more common than the elusive ulcer. This condition may be present in conjunction with a mild degree of pyelonephritis.

An ulcer of the bladder will almost always respond to medical treatment; it may be long drawn out, however, and it may be necessary to try a great variety of medication before relief is obtained. It is of fundamental importance to remove all possible foci of infection, as Bumpus has shown experimentally. It is necessary to try out a number of mediums for bladder lavage, such as mercurochrome, phenol, and silver iodid emulsion. In some cases continuous lavage with acid fuchsin for three or four hours daily has been of value. Some of these patients seem to have improved by rendering the urine acid and placing them on a diet high in protein. With the more infiltrating type of ulcer the more superficial methods of treatment are of no value. In some cases fulguration gives more relief than any other treatment, although it may not necessarily insure eradication. In six of the more resistant types mercurochrome was given intravenously, with relief in but one case. In this one, however, there was a striking recovery, following years of suffering and the use of practically every other available agent. However, I would not advise intravenous mercurochrome as a routine method of treatment for this condition, particularly because of the severe reaction and danger connected with its use.

I have gone over this broad subject rather hurriedly. In recapitulation: first, it may be of value to determine whether the urinary infection is ascending or descending, and next, whether the urine is acid or alkaline. If the reaction is acid and the culture negative, the diagnosis is probably renal tuberculosis. With infections of the descending or hematogenous types, the removal of all foci of infection is imperative. The use of internal medication with drugs such as hexylresorcinol has not proved to be very efficacious. Mercurochrome given intravenously should be reserved as a last resort in the very severe cases of infection. Stricture of the ureter is most commonly present with chronic pyelonephritis, and in such cases, is often relieved by means of dilatation. Stricture does not occur as frequently as some observers would lead us to believe, however. Finally, any form of intravenous medication should be used cautiously. We shall undoubtedly see great developments in intravenous treatment in the near future, but in the meantime one should use it conservatively.

THE SELLA TURCICA. Observations made by John D. Camp, Boston (*Journal A. M. A.*, Jan. 16, 1926), based on anatomic specimens and roentgenograms show the normal sella to vary in contour and size. Variations in contour may be classed into three types: the round oval and flat, of which the oval type predominates in the adult. The average sella will measure 1.06 cm. and 0.81 cm. in the anteroposterior and vertical directions, respectively. Variations in the shape of the clinoid processes are numerous, and union between the anterior, middle and posterior clinoids, producing a bridged sella occurs in about 5 per cent of cases. Such an anatomic variation seems to be of no clinical significance. Pseudodefects and apparent anomalies of structure are easily produced in a roentgenogram by faulty localizing technic. Pathologic conditions producing changes in the sella are numerous, and the differentiation of these changes as to cause is often difficult.

DIAGNOSIS OF LATE CUTANEOUS LESIONS OF SYPHILIS*

HENRY ODLAND, M.D.
SEATTLE, WASH.

Late syphilitic lesions of the skin are not of so frequent occurrence as in the days preceding modern therapy. This is partly due to modern methods of diagnosis, particularly of the early lesions, and partly to more effective therapeutic measures.

Late luetic lesions are, however, not infrequently encountered by the physician, and for that reason it is important that he be constantly on the alert in order that he may recognize their true nature when they do occur. Also the fact that they are more rarely encountered does not decrease their significance. On the contrary, it indicates the necessity of bearing in mind their characteristic features. In this discussion we are concerned only with diagnosis. Here, as in the early stages, accurate diagnosis is the factor of chief importance.

In early syphilis the diagnosis of the initial lesion should always be confirmed by a demonstration of the spirocheta pallida. It may be stated—indeed stressed—that the diagnosis of primary syphilis by means of the dark field microscope is more important than the clinical diagnosis. On the other hand, in the late cutaneous lesions we find the conditions almost completely reversed. The demonstration of the spirocheta pallida in these lesions is very difficult and often impossible. It is not a practical diagnostic aid. Here, also, the Wassermann reaction is negative in a certain percentage of the cases. Craig[1] reports results from a large series of cases of tertiary syphilis as showing a positive Wassermann reaction in eighty-seven per cent. Other workers report variable results.

Failure to perform the test on suspected cases is another cause for errors in diagnosis. It is a curious fact that one often neglects to call for the Wassermann test in these very cases. Many of the lesions, particularly the nodular lesions, are such apparently innocent and trivial manifestations that one is prone to regard them lightly. They are insidious in onset, slow in progress and usually free from subjective symptoms.

It is characteristic of the syphilitic to deny and conceal any infection he may have had; on that account the history of infection is often difficult to elicit. Occurring usually many years following the initial infection, the history given by the patient is then often unreliable, and it is only when confronted with the firm diagnosis of syphilis that he reluctantly recalls his youthful escapades. It may be noted, therefore, that the clinical diagnosis of the lesions of this stage is of the greatest importance, and it is my object to discuss the different types of lesions and briefly review their characteristic symptoms.

The lesions of this group present several characteristic features which serve to differentiate them from other disorders of the skin. They are generally observed in groups, and as a rule are asymmetrical in distribution.

Several lesions or groups of lesions may be seen at one time in the same patient, but often only single isolated foci are present. This tendency to grouping and asymmetry stands out in sharp contrast to the generalized and symmetrical eruption of the early secondary stage of the disease. Another characteristic of the late syphilides is their tendency to break down and ulcerate. Still another is the peripheral extension followed by healing of the central part of the lesion. Thus they assume striking shapes, but as a rule they are roughly circular in outline.

Syphilis has often been designated as a disease of circles, and if one examines these lesions, their circular arrangement becomes apparent. At times they appear as segments of circles, the borders being polycyclic, and at times also resembling roughly the shape of the kidney.

It is important to note the induration of syphilitic lesions of this stage. This symptom, particularly in nonulcerating and squamous lesions, often is the factor which decides the diagnosis, as between psoriasis and eczema on one hand, and syphilis on the other. This induration is the result of extensive and deep cellular infiltration, one of the chief pathologic characteristics.

The classification of late cutaneous lesions of syphilis proposed by Fox,[2] and adopted by the American Dermatological Association, is the one generally in use at this time. Following this outline, the lesions of this stage may be divided into two main groups, namely: nodular and gummous syphilides. To these may be added squamous syphilides.

The nodular syphilides are the tubercular syphilides of past years. Medical students often con-

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* Read before King County Medical Society, Seattle, Wash., Nov. 16, 1925.

[1] Craig, C. F.: The Wassermann Test. St. Louis, 1918. 140 pp.

[2] Fox, G. H.: The Classification and Nomenclature of Acquired Cutaneous Syphilis. Jour. Cutan. Dis., 1913, XXXI, 244-235.

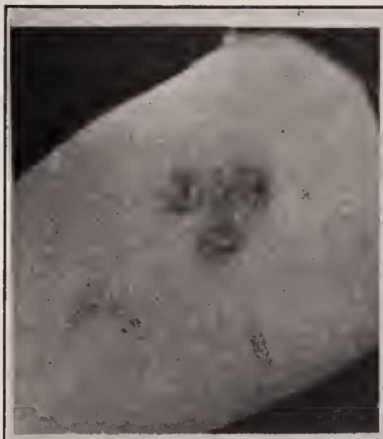

FIG-1

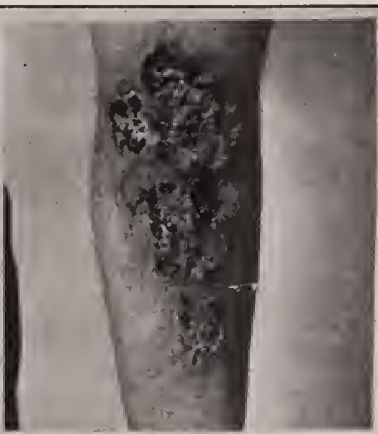

FIG-2

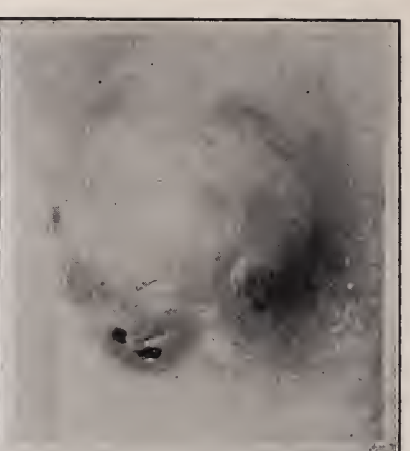

FIG-3

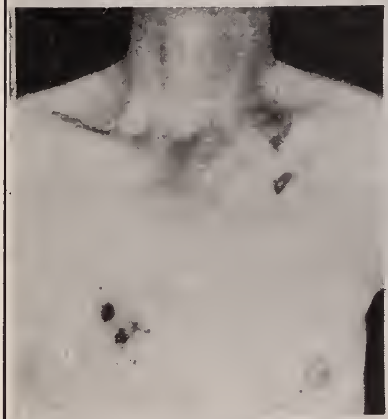

FIG-4

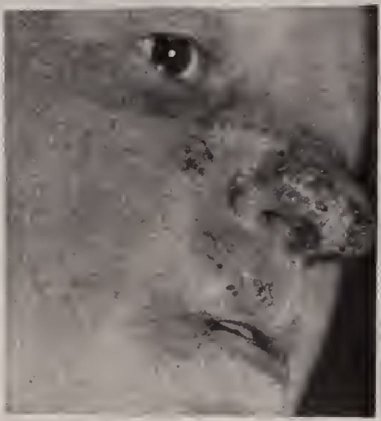

FIG-5

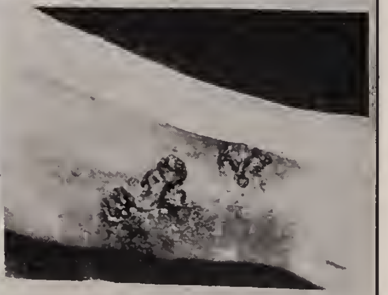

FIG-6

Fig. 1. Nodular syphilide of upper arm.
Fig. 2. Serpiginous ulcerating syphilide.
Fig. 3. Gumma of knee.
Fig. 4. Ulcerating gummata.
Fig. 5. Ulcerating nodular syphilide
Fig. 6. Erythema indurata.

fused the latter with tuberculosis, and for that reason the equally descriptive term, nodular, has been adopted. These may be subdivided into circinate, serpiginous and ulcerating syphilides, and where one lesion shows these various features, a combination of these terms is used in designating the type of lesion.

The nodular syphilide begins as a small nodule, or a group of small nodules in the skin (fig. 1). The individual lesions in many respects resemble the large papules of late secondary lues. They vary in size from two millimeters to one or two centimeters. Depending upon their duration, the color varies from pink to a dusky red or brown. The lesion is raised above the surface of the skin, is clean-cut and circumscribed. Its border ends abruptly. On palpation it is found to be firm and indurated. When there are several nodules in a group, they have a circular arrangement, generally in the form of segments of circles or arcs. As mentioned before, this grouping and circular arrangement is quite characteristic.

The lesions may be situated upon any part of the body, but the sites of predilection are the arms, face—particularly the nose and forehead—the neck, shoulders and upper part of the back. It is not unusual to find several groups, but as a rule there is only one active lesion. Old scars of healed lesions may be seen in other regions.

The course of the lesions varies. They may remain for some time as dry, infiltrated flat nodules and, as involution gradually takes place, the lesions are replaced by thin atrophic smooth scars. These scars at first show a deposit of brownish pigment, which is later absorbed, and then the typical white papery scar is in evidence. At other times they break down and ulcerate.

The serpiginous syphilides often present striking pictures. They may attain considerable size, at times covering areas larger than the hand (fig. 2).

They have polycyclic borders, and the tendency to ulceration is marked. They advance on the border, and healing in the center or at one edge is often noted. Ulceration may take place in only one portion of the lesion, but as a rule it is extensive, and secondary infection causes it to be covered with a purulent, dirty exudate. When the exudate dries crusts are formed. The ulcers here, as with luetic ulcers elsewhere, show the steep, often undercut edges.

Two varieties of gummous syphilides are encountered, the superficial and deep. The superficial gummata are often multiple and diffuse. The true gumma is situated deep in the corium and subcutaneous tissues (fig. 3). It begins as a mass of infiltrated cells and has a fibrous wall. As the mass enlarges, it encroaches upon the surrounding tissues, central necrosis occurs, and the wall and overlying epidermis is soon destroyed, which results in a rounded ulcer with typical undercut or steep edges, giving it a punched-out appearance (fig. 4).

The nonulcerating lesions may be mistaken for eczema, psoriasis, lupus erythematosis, rosacea, leprosy and epithelioma. Eczema as a rule itches, and it is not sharply marginated and circumscribed. It is usually symmetrical in distribution. From psoriasis the lesions are distinguished by the silvery scale and bleeding points of the former and the lack of induration. Lupus erythematosis has a symmetrical distribution, practically always confined to the flush area of the face and nose. It is covered with a dirty, grayish, adherent scale, which on removal shows the follicular plugs, pathognomonic of this chronic disorder. Rosacea may at times be confusing, but it is diffuse and ill-defined, and marked by vascular dilatation and new vessel formation. The lesions of leprosy are not so well defined and the laboratory demonstration of the lepra bacillus confirms the diagnosis. Epithelioma of the basal-cell type occurs commonly on the face. The lesions are smaller as a rule, and they develop very slowly. They have a distinct pearly border and coursing over the surface of the lesions are fine dilated capillaries.

Ulcerating syphilides (fig. 5) may be confused with lupus vulgaris, scropuloderma, epithelioma, erythema indurata (fig. 6) or Basin's disease, varicose veins and dermatitis artefacta. It is true that the Wassermann reaction is negative in these nonsyphilitic lesions, but the diagnosis of syphilitic lesions should be made clinically and confirmed by the laboratory. Lupus vulgaris seldom begins after twenty. It is slower in progress, more indolent in character, and shows the typical apple-jelly nodules so characteristic of the disease. Scrofulodermata usually appear over the glands, particularly of the neck, and over the bones of joints. The irregular scars of former attacks are often in evidence. They have a tendency to sinus formation, which is tunnel-like. The presence of tubercle bacilli is demonstrated by guineau-pig inoculation. Varicose ulcers lack the polycyclic outline and induration of the luetic ulcers. They bleed easily and the presence of patches of eczema and varicose veins are of value in differentiation. Dermatitis artefacta is so characteristic that the picture once observed is seldom forgotten.

ABUSE OF VASOTOMY*

Glenn S. Morgan, A.B., M.D.
ASTORIA, ORE.

In the past ten months it has been my fortune, or misfortune, to see ten young men upon whom a vasotomy had been performed. The cases were interesting because the histories were so uniform, the symptoms striking though simple, the physical findings so similar and the results of treatment so disappointing.

At the last two meetings of the American Urological Association papers were read and discussed on medication of the seminal vesicles through the vas deferens. Rolnick[1] showed the results of the various antiseptics used, Mark[2] presented the indications and incidentally the contraindications, and Thomas[3] his vasopuncture. Belfield,[4] who is credited as the father of the operation, discussed the possible injuries. Attention seemed to be centered upon occlusion of the vas and consequent sterility.

In my series, according to the patients' stories, the vasotomy had been performed to cure a gonorrheal urethritis, eight of which were subacute and two were chronic at the time of the operation. Injections were bilateral and apparently mercurochrome-220 had been used, as a red stain was expressed by the one or two massages that followed. A Steinoch had probably been performed in one case.

When seen by me, the only complaint was that of a "morning drop" and a certain morbidity, mainly expressed as a distrust of all doctors. In none was there a discharge during the day. Examination of this drop revealed it to be composed of mucus and pus cells, with a few epithelial cells scattered about. Gram-negative diplococci were absent but a few staphylococci were present. Upon repeated cultures on beef testicular agar after the method of Hogan,[5] only one case showed the gonococcus. Following exposure, he developed an acute anteroposterior urethritis and later arthritis.

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* Read before Clatsop County Medical Society, Astoria, Ore., Nov., 1925.

There were large shreds in the first glass and a few in the second which were composed of mucus and pus. There were no strictures of the urethra. The prostate was not enlarged but in all cases the vesicles could be palpated. Three were hard, corded, tonic, while seven were large, boggy and atonic. Upon stripping the former, small casts were urinated, while in the latter extremely large casts appeared. Examination of the fluid expressed showed motile spermatozoa in one, dead in three and none in six.

Upon examination with the endoscope the anterior urethra did not deviate from normal, but the posterior urethra was highly vascular, lusterless and granular. The openings of the prostatic ducts were yellowish and surrounded by a reddened border, the mouths of the ejaculatory ducts being similar. The colliculus was extremely large, turgid, dull and cyanotic. Bleeding and tenderness were more marked than normally.

Treatment over a period of six months consisted of irrigations, sounds, massages, topical applications and application of silver nitrate directly to the veru. Tincture of time was liberally used. Recent examination revealed that the condition was the same as though no treatment had been instituted.

CONCLUSIONS

1. Vasotomy is a logical and valuable form of therapy in certain cases, especially those of recurrent epididymitis and gonorrheal arthritis.

2. It should be performed only by one whose technic is not only perfected but whose judgment is excellent.

3. When one sees cases such as the above, one would tend to condemn vasotomy. The abuse of basic surgical principles due to ignorance or poor technic will cause any form of treatment to become of bad repute.

The question of poor technic as against poor judgment in the above cases cannot be determined, but the latter is more probable.

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TUBERCULOSIS OF THE KIDNEY*

Squire Bozorth, M.D.
PORTLAND, ORE.

The most constant symptom of early renal tuberculosis is frequency and burning on urination. This symptom is also characteristic of many other abnormal conditions of the genitourinary tract and very often confronts the general practitioner. Although tuberculous involvement of the kidney is not one of the usual causes of this symptom, it should always be kept in mind, and other symptoms and physical signs of the condition should be sought for. No patient presenting this symptom, plus other suspicious findings, should be discharged until a careful search of the urinary tract is made for the tubercle bacillus. If such tests are neglected, it will not be long before the patient will have a hopeless involvement of the bladder and both kidneys.

In this paper I will discuss the etiology, the chief symptoms, the pathology most frequently found after operative procedure, the diagnosis and the most beneficial means we know of treating the condition at the present time. In concluding, I will review the histories of a few cases, the treatment instituted and the results obtained.

Etiology. Tuberculosis of the genitourinary tract is a condition which, with very few exceptions (and according to authorities these are very questionable) is due to a focus of infection in some other part of the body. It occurs in the kidney more often than in any other organ of the genitourinary tract; in fact, probably as often as all other places put together. Autopsy reports show that it is primarily unilateral, although if untreated in the advanced stages, almost invariably it becomes a bilateral condition. Halle and Motz in a series of 131 postmortems found 89 cases of unilateral disease. Reports also show that it is more frequent in the right side. In a series of cases presented by one man, 72 per cent of the lesions were on the right side. Authorities differ as to whether it is more frequent in men or women, although most reports show a slightly higher percentage in the female.

Tuberculosis of the kidney most commonly appears between the ages of twenty and thirty. This is taking into consideration both types of the disease, the acute and chronic. The acute form, or miliary, is more frequent in childhood and is really a medical condition, while the chronic caseous form, in which we are more interested, is most frequent in young adults.

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*Graduation Thesis, Department of Surgery, University of Oregon Medical School, Portland, Ore., June, 1925.

The predisposing causes of renal tuberculosis are, first, a weakened condition of the system in general which diminishes the resistance of the body; and, second, a condition of the kidney favoring infection, such as a congestion from traumatism or other causes, irritating products in the urine, renal calculus, or undue mobility of the organ. A tuberculous family history is quite common in all cases.

The active cause of the condition is the entrance of the tubercle bacillus into the organ. It is maintained that the bacillus can pass through a normal kidney, ureter and bladder without giving rise to renal involvement, but when the organism finds the proper condition present, as mentioned above, it will remain there and infect the organ.

As to the mode of infection, the organism can reach the kidney by three routes, the hematogenous, the lymphogenous and the ascending route from the bladder. However, it is quite probable in most cases that the organisms reach the kidney through the general circulation.

Pathology. The two types of tuberculosis of the kidney are the miliary and the caseous. The miliary type is part of a generalized tuberculosis. It is characterized by the presence of miliary tubercles scattered throughout the organ. Upon gross inspection they can be seen as fine pearly white nodules beneath the capsule. Upon sectioning the kidney they will be found scattered throughout the cortex.

The caseating form is characterized by irregular appearing caseous chessy nodules throughout the kidney substance. Grossly the kidney is usually enlarged and nodular. Upon sectioning, these nodules present the microscopic morphology which characterizes all tuberculosis nodules. In a purely tuberculosis kidney, which is rare, you find a contracted and nodular organ, due to the formation of fibrous tissue and cicatrization.

When a secondary infection occurs with pus producing organisms, a different picture is presented. The caseous nodules enlarge, suppurate and expel their contents into the kidney pelvis or, perhaps, into the capsule, from which it breaks through with the formation of a perinephritic abscess. The various forms of kidney disease we see after infection with pus-producing organisms are pyonephrosis, abscess of the kidney and pyelonephritis.

Another change that may take place is a thickening of the wall of the ureter, with an occlusion of its lumen and as a result a stasis of the urine in the kidney with a resulting hydronephrosis. The changes in the size, shape and appearance of the kidney depends upon the presence of a single or mixed infection, the organism present, the amount of thickening, of stricture formation in the ureter, the amount of kidney tissue destroyed and the rapidity or slowness of the process.

Symptoms. The thing for one to strive for is an early diagnosis, as tuberculosis of the kidney is a progressive condition. The earlier the diagnosis is made the better the patient's chances will be for relief of symptoms and possible cure. It has been proved that nephrectomy is a life saving measure, if performed while the disease is unilateral, even when vesical tuberculosis complicates. From a review of the literature it is quite evident that the main reason better results have not been obtained in the past is that the diagnosis in most cases is made too late. As I have already stated, in the greater percentage of cases the involvement originally is limited to one kidney and the other becomes involved late in the disease, only after a congestion and additional load have been thrown upon it.

I will first point out the early symptoms that, presented by a patient, should always lead to a careful investigation with the possible diagnosis of tuberculous kidney in view. In a young individual, too young for a senile hypertrophy of the prostate, the first symptom in the majority of cases is frequency of urination, especially at night. Always on finding this symptom, plus an acid urine containing blood and pus cells and seemingly free from bacteria, a search for the tubercle bacillus should be instituted.

Although this is the mode of onset in from 65 to 75 per cent of the cases, other clinical pictures forecasting the beginning of the condition may be presented. Among them may be mentioned those characterized by pain which may vary a great deal in nature and location. These cases constituted about 20 per cent of the total. Another group is ushered in by the symptoms of either an acute or chronic nontuberculous renal involvement. The clinical picture is very puzzling in these cases and often is such that one can make only a diagnosis of a nontuberculosis infection of the kidney. In other cases the initial symptom is a more or less severe hematuria. The frequency with which this group occurs varies, but some authorities claim it constitutes as high as 20 per cent of the cases.

The symptoms which should lead one to suspect an advanced case of renal tuberculosis can be tabulated under the headings subjective, objective, general and local.

1. Subjective:
   a. Pain in loin.
   b. Pain in bladder.
   c. Frequency of urination.
   d. Tenesmus.
   e. Burning on urination.
2. Objective:
   a. Increased amount of urine.
   b. Hematuria.
   c. Pyuria.
3. General symptoms:
   a. Fever.
   b. Sweating and chills.
   c. Loss of appetite.
   d. Loss of weight and strength.
4. Local symptoms:
   a. Tumor.
   b. Abdominal tenderness and muscular rigidity.
   c. Swelling or suppuration of glands, genitals, bones or joints.

Diagnosis. History. In making a diagnosis of renal tuberculosis in a suspected individual, a carefully taken history is of extreme importance. By so doing one can gain much information which in conjunction with physical examination and laboratory work will either clinch or eliminate the diagnosis of tuberculosis of the urinary tract.

General examination. Search should be made for latent or healed foci of infection in the lungs, for, as stated in the beginning, it is very seldom that you find renal tuberculosis without a focus of infection at some other point in the body. For this reason in suspected cases, where no foci are demonstrable in the lungs, all other tissues of the body should be palpated for any enlarged and tender masses.

Cystoscopy with the aid of ureteral catheterization is essential in the study of any surgical kidney case. Many things can thus be determined which are essential to making the diagnosis. The pathology which one may find in the bladder varies from a perfectly normal bladder to one with extensive tuberculous pathology. The degree of bladder change depends upon the virulence of the organism, the duration of the infection and whether there is an associated infection with an ordinary pyogenic organism. In an early case one will find only the inflammatory changes which would occur in a cystitis due to bacillus coli. This same picture may also be presented in an advanced case, where there is a stricture of the ureter on the affected side.

Among the different pictures found in the bladder which would lead one to suspect a tuberculous condition are the following:

1. The presence of grayish, and later yellowish, nodules in the mucosæ. These are especially suspicious, if found around one ureteral orifice.

2. Ulceration varying greatly in size, shallow with irregular edges and at times showing grayish nodules in their edges or immediate vicinity.

3. Changes in the ureteral orifices. The presence of ulceration and tubercles with gaping and rigidity of the orifice. In later stages a retraction of the orifice.

The making of a positive diagnosis depends upon the finding of the tubercle bacillus in a specimen of urine obtained by ureteral catheterization. There have been reported cases in which the tubercle bacillus has been found in the urine, when the kidney failed to show tuberculosis, but this is rare. The infrequency of it may be illustrated by Judd's statement that at the Mayo clinic tuberculosis of the kidney has been demonstrated in every case in which the organism was found in the urine. Other organisms, such as the smegma bacillus that are very similar morphologically and in staining reactions to the tubercle bacillus, are found in the urine and may lead to an error in diagnosis. Since the smegma bacillus is most common and is found about the external genitalia, great care should always be exercised in collecting the specimen.

The urine from a tuberculous kidney is pale, acid, usually sterile and free from offensive odors. Pus and red blood cells are almost always present. The presence of blood is one of the earliest symptoms. Very frequently infection with some other organism, such as the colon bacillus, staphylococcus or streptococcus, is present. If colon infection is present, instead of an inoffensive odor the foul smell characteristic of infection with this organism will be imparted from the urine. The urine is always increased in amount and of high specific gravity.

A complete roentgen ray study should be made of both kidneys, the ureters and the bladder. No surgical kidney diagnosis is complete without x-ray study. This will often show the presence of shadows, due to caseous or calcified material in the tubercles. These should always be differentiated from a calculus. X-rays will also give information as to the size, shape and location of the kidney.

Treatment. The treatment of tuberculosis of the kidney is both hygienic and surgical. The hygienic treatment is the same as for pulmonary tuberculosis, i.e., rest, abundant food, pleasant environment, fresh air and sunshine. Heliotherapy in conjunction with surgical treatment and even without in the hands of some has given marked benefit. Myell reports a series of several cases on which he used heliotherapy exclusively with very good results. At the end of this paper I will give the histories of two patients who were treated with the Alpine lamp in conjunction with surgical procedure.

The surgical treatment is nephrectomy. The technic used at the Mayo clinic is as follows. A posterolateral incision is made, starting at the costovertebral angle and extending downward and forward to a point midway between the crest of the ilium and the last rib. The latissimus dorsi, external oblique and internal oblique muscles are cut, care being taken not to injure the branches of the iliohypogastric and the ilioinguinal nerves. The erector spinæ muscles are either partially cut or retracted toward the spine. The quadratus lumborum muscle and costovertebral ligament are cut, if necessary to complete the exposure. The kidney is now reached by tearing through the perirenal fat, which as a general rule is adherent and edematous. As much as possible of the perirenal fat should be removed, since it may cause persistent drainage, if allowed to remain. The pedicle is clamped with two heavy forceps; it is then cut between these forceps and the hemostatic clamps. The pedicle is firmly ligated and the inner clamp removed.

In most cases a portion of the ureter is removed. If it is strictured and dilated, it is desirable to remove as much as possible. Like the bladder, the ureter rarely remains infected after the tuberculous kidney has been removed. Extensive operation removing the entire ureter is, therefore, rarely indicated. Various methods of disposing of the remaining stump of the ureter have been employed. Kocher injected iodine and Israel carbolic acid into the ureter. Kimmel employed an especially constructed thermocautery to obliterate the ureteral lumen. At the Mayo clinic the ureter is usually cut with the cautery and the retained end ligated with catgut. Israel in a review of some thousand cases says that the method of treating the ureter has no marked influence on the formation of fistulæ.

In March 1924 the Mayo clinic reported a series of 863 cases, on whom nephrectomy had been performed as described below. Complete postoperative data were obtained in 611 of these. Eighteen were bilaterally infected and one kidney was removed. Four died from anuria immediately following the operation, and ten died during the next eighteen months. Twenty-three patients died the first month after operation. One hundred and ninety-one are dead; 358 are completely cured on an average of four years after operation and 62 are still having urinary trouble.

In a series of 204 cases operated on by Suter he had an immediate mortality of 2.5 per cent and complete recovery in 60 per cent. Bandel reports 72 per cent recovery.

REPORT OF CASES

Case 1. Mr. T., age 54, by occupation a furniture finisher, was admitted to the Multnomah County Hospital March 21, 1924, with the following complaints. (1.) Pain in bladder and kidney region and extending down into the penis, increased by urination. Duration three months. (2.) Hematuria, nocturia, polyuria and dysuria for approximately the same length of time. Two years previously the patient had been confined to his bed with kidney trouble, the symptoms of which were very similar. Lung trouble for the past four weeks. Catheterized specimen of urine showed one plus albumin, four plus pus cells, two plus blood and some epithelium. Guinea pig inoculation was positive for the tubercle bacillus. Cystoscopic examination showed a highly inflamed bladder with two or three ulcers very suggestive of a tuberculous condition. The right ureteral orifice was very edematous and red, the catheter being passed with some difficulty.

April 4, 1924, the patient was operated upon, a right-sided nephrectomy being performed. Pathologic examination showed (1) miliary conglomerate and caseous tuberculosis, (2) an arteriosclerotic kidney.

The patient showed immediate improvement, gaining some 25 pounds in weight during the first month. After an elapse of two months he was still bothered with some frequency and suprapubic pain. At this time treatment with the quartz lamp was instituted. The patient was exposed both anteriorly and posteriorly for one minute the first day. The interval was increased one minute each successive day. At the present time he is entirely relieved of his symptoms.

Case 2. Mr. G., age 48, by occupation a logger, was admitted to Multnomah County Hospital March 1, 1925. His complaint was: (1) Incontinence of urine, passing water every five to ten minutes. Unable to go over one-half hour. (2) Hematuria, no clots. (3) Pain in bladder and right kidney. Pain in bladder was burning and shooting, that in the kidney more of a soreness. First symptom noticed was frequency of urination about four and one-half years ago. At first had to get up once or twice a night, increased and within a period of two or three weeks was arising ten or fifteen times. Then noticed pus in the urine which seemed to precede the stream. About two years later noticed blood associated with pus in the urine. About six months later operated on in Tacoma, at which time a right-sided nephrectomy was performed. No relief of symptoms after the operation, although condition has not been growing worse.

Upon admission to the Multnomah Hospital the patient was put on the following treatment: (1) Daily bladder irrigations with 1/5000 solution of potassium permanganate, followed by injection of 20 c. c. of a 10 per cent solution of neosilvol. (2) Quartz lamp. The treatment instituted was the same as in foregoing case. At the present time, although it is too early to draw any conclusions, the patient has had some relief from his symptoms.

Case 3. Mrs. O, age 45. Occupation housewife. Admitted Portland Sanitarium, July, 1924.

Family history. Mother and two sisters dead of tuberculosis.

Past history. Scarlet fever age six. Typhoid fever age eleven. Influenza 1918. Not strong, always had more or less ovarian trouble. Ovarian cyst removed.

Present complaint. Twelve years ago patient began having night sweats, chills, fever and loss of weight. At this time bothered with frequency of urination and pain of voiding. Went to a doctor who found mass in right side which he diagnosed gallbladder. Operated upon and a perinephritic abscess found. Drained for eight months. Symptoms removed. At present time no bladder symptoms.

Cystoscopy. Ulceration with cicatricial contraction around right ureteral orifice, with marked hyperemia. Moderate trigonitis. Unable to pass catheter. Urine positive for tubercle bacillus otherwise negative.

Physical examination. A large mass on right side of abdomen which is movable. Not tender.

Nephrectomy performed.

Microscopic. Miliary conglomerate and caseous tuberculosis. A great number of tubercles in the medulla.

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TRAUMA AND TUBERCULOSIS OF KIDNEY IN A DIABETIC

CASE REPORT

H. W. Howard, M.D.
AND
John LeCoque, M.D.
PORTLAND, ORE.

From the Urology Service,
Multnomah County Hospital

The following case is interesting because of two unique features. First, trauma appears to have been a factor in localization of tuberculosis in a kidney, and, second, a fistula developed between the pelvis of the kidney and the skin through Petit's triangle. It is seldom that any sort of injury, as in other locations, is concerned in the inception of renal tuberculosis. One or two cases are reported.[1] Spontaneous renocutaneous fistulæ occur very infrequently.[2,3,4] That the fistula traversed Petit's triangle is obviously due to the weakness of the area and its nearness to the kidney.

Mrs. N. D., age 61.

Family history. Father died at 71, cancer of stomach. Mother died at 75, senility. Brothers. One has tuberculosis.

Past history. Pneumonia when a child. Had puerperal septicemia following childbirth, influenza several times, kidney trouble for some years, i. e., frequency.

Chief complaint. Patient was first admitted Aug. 27, 1924, complaining of an abscess over the left hip region which had been present for some years. The abscess came on some time after a fall, and at which time she injured herself in the left hip region. A few days previous to admittance the abscess had ruptured. Patient also complained of diabetes.

Physical examination showed nothing abnormal except bilateral cataracts and a fluctuating mass over the left posterior superior iliac spine. The mass was the size of a small walnut, very tender but no evidence of hyperemia.

Diagnosis, draining sinus from psoas abscess.

Progress. Patient was placed on 1500 caloric diet with a total glucose of 91 grams. She improved rapidly and was discharged on Oct. 5. The draining sinus over the left posterior superior iliac spine was healed.

On April 27, 1925, the patient was readmitted with the complaint that the former abscess had again broken open and was draining. Physical examination again disclosed a draining sinus over the left posterior superior iliac spine. There was some purulent drainage from this sinus.

Diagnosis was again made of a draining sinus from a psoas abscess.

Progress. At this time Dr. A. W. Baird thought it advisable to curette the sinus. A mass of calcareous matter was removed which on microscopic examination was shown to consist of debris with lime salt deposits. The sinus was injected with bismuth paste and the findings showed that the bismuth probably extended up towards the pelvis of the left kidney and also down into the pelvic cavity. The sinus again healed readily and patient was discharged from the hospital on May 27.

On July 9 patient was again admitted, suffering from the same trouble for which she was admitted the first time. Physical examination showed a draining sinus over the left posterior superior iliac spine.

Progress. It was noticed that the discharge from the sinus did not entirely consist of a purulent material but that some watery secretion was mixed in the discharged contents. The suspicion was aroused that the sinus was probably connected with the pelvis of the left kidney or the left ureter. The patient was, therefore, given methylene blue by mouth and the dressings over the sinus were examined to determine if the dye was excreted. A few hours later the dressings covering the sinus were found to be stained very markedly with the dye. A few days later an intragluteal injection of phenolsulphonphathalein was given but none of the dye could be recovered from the dressings covering the sinus.

On July 22 a cystoscopy was done by Dr. Howard. The bladder mucosa and ureteral ostia appeared to be normal. The right ureteral ostium readily admitted a catheter but the left would not because of an apparent stricture close to entrance of the latter into the bladder wall.

An attempt to get a pyelogram of left side was unsuccessful. On July 25, cystoscopy was again attemped. At this time the left wall and floor of the bladder were protruded into the cavity of the bladder in such a manner so as to occupy about half the space. It was thus impossible to catheterize either ureter. A large fluctuating mass occupied the left lower loin and side of the abdomen and protruded visible when the patient was in a sitting posture. In view of the fact that the left kidney was apparently practically functionless and because no kidney functional test could be carried out because the left ureter could not be catherized, it was decided to remove the left kidney.

Nephrectomy was performed on July 29. An oblique line incision in the left side from tip of twelfth rib to iliac crest exposed a small kidney surrounded by much scar tissue, particularly in the upper and lower poles. The fistula heretofore referred to commenced with the pelvis. The poles were liberated by dividing the scar tissue and the vascular pedicle was tied off in the usual manner; kidney removed and wound closed. Patient was then put on her back and a diagonal incision made above the symphysis on the left side. Incision was made down to the peritoneum. This was separated down to the ureter, which was legated close to the bladder and cut off. Kidney and ureter were then delivered through the incision. Drains were placed and the incision closed in the usual manner.

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[1] Persson, Mauritz: Clinical Notes on Tuberculosis of the Kidney. Ann. Surg. Jan., 1925.

[2] Walker, Thomson: Genito Urinary Surgery. Jan., 1914.

[3] Kidd, Frank: Urinary Surgery, Oct., 1910.

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The pathologic report was as follows:

Gross. The kidney and ureter together weigh 90 grams. The kidney has previously been opened, exposing a greatly enlarged pelvis, covered with thickened mucosa which is thrown into papillomatous projections. The calyces are dilated. Diminution in kidney parenchyma is very marked and the normal markings are nearly or completely obliterated. The caspule is very densely adherent to the cortex and is much thickened. The wall of the ureter is very thick, measuring fully .5 cm. and its mucosa has the same appearance as that of the kidney pelvis. No gross evidence of tuberculosis is seen.

Microscopic. Sections from various parts of the kidney disclose essentially the same changes in all. These consist in wide areas of destruction of parenchyma, especially in the pyramids, with either infiltration by large numbers of wandering cells of all types, or dense hyalin fibrosis. Pus cells and cellular debris occur in many of the collecting tubules. In the cortex there is a general and widespread thickening and hyalinization of the capsules of Bowman, with a general hyalin degeneration of varying degrees in practically all glomerular tufts. In several places discrete structures having all the characteristics of tubercles are seen. These all have giant cells of the foreign body type in their substance. The epithelium lining the pelvis is irregular and in places is hyperplastic. The same is true of the almost entirely obstructed ureter. The wall of the ureter is composed almost entirely of dense hyalin connective tissue infiltrated with small round cells. No tubercles are seen here.

Pathologic diagnosis. Mixed tuberculous and pyogenic pyelonephritis and ureteritis. Marked chronic glomerular nephritis.

Postoperative progress. In order to ward off a postoperative acidosis on account of the diabetic condition of the patient, glucose and insulin were given before and after the operation with excellent results. She was also placed on 1500 caloric diet with total glucose content of 91 gm.

She was apparently doing well until about four days following operation. The urinary excretion became progressively less. Finally all urinary excretion stopped. One day after urinary excretion had entirely stopped blood was taken for determining the amount of nonprotein nitrogen present. The results were as follows:

Nitrogen of urea	97.2 mg.
Uric acid	6.0 mg.
Creatinin	4.7 mg.

The patient had headaches at this time. There was slight edema of the feet. She was given magnesium sulphate by mouth in sufficient quantities to produce watery stools. Hot packs over the right kidney area. She was digitalized. There was no improvement. On the fifth day of the anuria more blood was taken for determining non protein nitrogen. The result at this time was as follows:

Nitrogen of urea	135.0 mg.
Uric acid	8.6 mg.
Creatinin	7.5 mg.

In the meanwhile the magnesium sulphate by mouth and hot packs over the right kidney region had been continued constantly. The patient now was very drowsy, had frequent emesis, very severe headaches and there was a very strong uremic odor to the breath. At this time it was decided to use theobromine et sodiosalicylas (diuretin) as a last resort. The patient was given .6 gm. doses every two hours for a 24-hour period.

On the following day it was noticed that she had a distended bladder. She was catheterized and 800 c.c. of urine obtained. The daily amount excreted gradually increased and within three days she was excreting approximately 1400 c.c. of urine every 24-hour period.

However, the patient was unable to void and had to be catheterized three times in 24-hour periods. She developed a marked cystitis and a retention catheter was placed in the bladder, which was irrigated daily with mercury cyanide solution. The cystitis rapidly cleared up and retention catheter was permanently removed about two weeks later.

About three weeks following the reestablishing of urinary secretion more blood was taken to determine the nonprotein nitrogen. The results were as follows:

Nitrogen of urea	11.5 mg.
Uric acid	2.0 mg.
Creatinin	1.9 mg.
Sod. chloride	495.0 mg.

Patient is now clinically well. The old sinus over the left posterior superior iliac spine is completely healed and there is no evidence of any mass forming again in this region.

Laboratory findings. Blood: Erythrocytes 4,300,000, hemoglobin 85 per cent, leucocytes 400, Wassermann negative.

Urine has shown traces of sugar on former admissions but on a diabetic diet patient, doing well with no glycosuria.

Relief of Hay-fever by Intradermal Injections of Pollen Extract. The results obtained in a series of twenty-nine cases of hay-fever intradermally treated with pollen extract and the technic employed are detailed by E. W. Phillips, Phoenix, Ariz. (*Journal A. M. A.*, Jan. 16, 1926). The pollen extracts were made from local pollens by a modification of Clock's method, and Coca's fluid was used as a diluent. They were the same that had been used in the subcutaneous treatment, and except for the advantage inherent in the use of local pollen, they were not different from other good extracts similarly prepared. The relative potency of the extracts may be judged by the fact that an ordinary preseasonal (preventive) course begins with 0.05 cc. of the 1:5,000 dilution and ends with 1 cc. of the 1:500 dilution. This is enough to protect the average patient, and many never tolerate so much and still are protected. The increase in dosage was adjusted to the tolerance of the individual patient, the attempt being to produce a local reaction about the size of the patient's palm, which reaction should begin to subside within twenty-four hours. With some patients the dose could be doubled at each treatment; others tolerated only a 50 per cent increase, and occasionally a dose had to be repeated without increment. When relief was obtained, the dose interval was doubled, and the progressive increase of dosage was continued. Then, after three or four doses, the patient was directed to return at the first sign of hay-fever, and at ten-day intervals even if no symptoms had recurred. Intradermal injections are painful if more than 0.25 c.c. is introduced into one wheal. Accordingly, it was found necessary to add dilutions of 1:2,500 and 1:250 to the armamentarium. Treatment of these twenty-nine patients by the intradermal method, according to Phillips, was monotonously successful. Complete relief, or so near an approximation to it that the patients were comfortable and satisfied, occurred in every case.

STRICTURES OF THE ESOPHAGUS

METHODS OF RECONSTRUCTION OF THE ESOPHAGEAL LUMEN*

PAUL W. SPICKARD, M.D.
SEATTLE, WASH.

The most frequent forms of stricture met with are those due to swallowing of a corrosive acid or alkali.[1] This fact is associated with the general popularity of cleaning mixtures. The method of treatment varies with the site of the stricture, of which there may be more than one. If ordinary esophagoscopy and bouginage are indicated and the stricture is amenable to this form of treatment, the site of obstruction is not so important; but the stricture which commonly occludes the lumen and resists all efforts at bouginage is best and most safely treated, if located at the upper or lower end. Gastrostomy and exposure are used for the lower end and external surgery for the upper end.

A review of the literature on this subject is given by King, as regards methods of restoring the lumen of a completely occluded esophagus in the thoracic portion. Complete occlusion is very rare.

Chevalier Jackson in peroral endoscopy states, "Strictures of the middle third of the esophagus are not amenable to any treatment at present known, and the patient will have to be satisfied with gastrostomy until the transthoracic esophagostomy has been fully developed." The same author in Bronchoscopy and Esophagoscopy, 1922, states, "Impermeable strictures of the middle third of the esophagus have not been successfully treated by surgical means."

Murphy and Iglauer, in Transactions of the American Laryngological, Rhinological and Otological Society, report a case of complete occlusion of the middle esophagus, with attempt to restore the lumen with the electric cautery. The peroral endoscopist used the cautery with the light of the retrograde esophagus as a guide. The patient was able to swallow, but died fourteen days later, cause unknown.

A case is reported at the Jefferson Hospital, in which the stricture was perforated with manipulation during combined peroral and retrograde esophagoscopy. The child developed measles and bronchopneumonia and died.

Gussenbauer and Bayer have reported a case. The esophagus was exposed to the thoracic aperture and pulled up as far as possible. After making incision into the lumen, a small knife was inserted and pushed blindly down into the stricture, and gradually by the use of the knife and a small metal bougie the lumen was restored. The patient recovered and was under observation four years.

Lange (*N. Y. Med. J.*, 1890) reports a case of stricture 5 cm. above the diaphragm. By constant manipulation from above and below, a small whalebone bougie was passed through the stricture from above down.

Taylor (*Charlotte, N. C., M. J.*, 1901) reports a case of impassable stricture of the lower end of the esophagus and the lumen restored by forcing small whalebone bougies through the stricture and afterward cutting the stricture by the Abbe string-saw method.

Honigman (1900) presented a patient who had been operated upon. By passing what he terms a hollow bougie down to the stricture he was able to push small celluloid probes through the stricture. The patient gained ten pounds weight in a very short time.

Alamartine and Sargnon (*Revue de Chirurgie,* 1912, xlvi) report a case, in which the esophagostome was used successfully. The patient lived four years. In a second case, in which the esophagostome was used, the result was fatal to the patient, a child of four years.

Fischer (*Surg., Gyn. & Obst.,* 1911, xii) performed transthoracic cardiotomy in a boy of six years, in whom every attempt at restoring the esophageal lumen had failed. The result was not determined as the child died after completion of the operation through some unfortunate accident to the anesthesia apparatus.

Meyer presented a patient with a complete stricture of the esophagus at the New York Surgical Society about 1903. He made an osteoplastic flap of the ribs for gastrostomy, pulled the esophagus upward along with part of the stomach, and through this excellent exposure of the esophagus and stomach attempted to perforate the stricture which was located above the cardia. In spite of all efforts, the manipulation failed.

CASE REPORT

Patient, age 24, had swallowed a mixture containing two tablets of bichloride, dissolved in two ounces of lysol. Aug. 11, 1922, he could swallow only liquids. Had lost much weight. A gastrostomy was done. His condition was built up. Morphine sulphate, gr. $\frac{3}{8}$, and atropine, gr. 1/150, were given, and the stomach washed until the fluid returned clear.

With a medium Jackson esophagoscope above and a small Mosher esophagoscope below, under the fluoroscope, long biting forceps were used through the upper endoscope to the stricture which appeared to be one-half to three-fourths inch thick. Forceps were passed by biting and pushing. The instrument was removed and the patient put to bed under close observation. No untoward symptoms having developed, a small filiform bougie with a string was passed into the stomach from above. The bougie was removed, and dilatation was done by a series of metal bougies until November, when a No. 40 French was passed. Then she was instructed to pass bougies and discharged.

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* Graduation Thesis, Department of Surgery, University of Oregon Medical School, Portland, Ore., June, 1925.

She gained one hundred pounds in weight and has no difficulty in swallowing food. This stricture was at the third intercostal space, eight and one-half inches from the incisors.

Chevalier Jackson[2] had seven cases under treatment at one time at Jefferson Hospital for esophageal stricture, due to swallowing caustic alkalies. A number of cases were under treatment as outpatients at the same time. He concluded that the labels on lye packages are insufficient, and that they should be labeled as are all poisons sold by druggists.

A case is reported,[3] in which the antethoracal osteoplastic operation was done on a girl of seventeen years for congenital stenosis of the esophagus. The new esophagus was constricted from a loop of small intestine. The three operations were at two and four week intervals, and done early in 1920. The formation of the skin tube was the last step in the procedure. The success was complete.

Goris gives details[4] of three cases of cicatricial stricture of the esophagus successfully treated by dilatation and bouginage with bougie No. 15, and sawing a silk thread back and forth. Depage's olives were strung on the thread. He has thus succeeded in curing all of his twelve cases in children and adults in which the esophagus seemed to be permanently closed.

A case of congenital stenosis of the esophagus is reported by Frey.[5] The newborn infant vomited at once almost all it ingested. As it grew older the difficulty in swallowing was intermittent. The child was taken to different hospitals and treated with various courses of dieting without avail. Esophagoscopy finally revealed a valve-like protrusion of normal mucosa one or two cm. above the cardia. Frey cut the free edges of this dilated portion, using a small foreign-body forceps. He followed this with systematic dilating procedures every two or three days and in a month the boy was able to eat normally.

Henle[6] describes his success in treating esophageal strictures. On account of the difficulties from kinking in the introduction of rubber tubes into the esophagus, he had a number of smoothly polished ivory "olives" made, of varying diameter, the length varying with the diameter. The olives were strung on a silk cord at intervals of from 10 to 12 cm. A knot was tied above and below each olive, which served to keep it in place. In treating a child aged 3, who had swallowed six months previously a caustic fluid, he introduced two threads into the esophagus, passed one thread to serve in an emergency out through the nose, and the other through the mouth. Once or twice daily he attached the string of olives, well oiled, to the thread passing out of the mouth. The smaller olives were below, with the more conical ends downward. Through a gastric fistula the string of olives was then drawn through the esophagus. As the olives passed the stricture, a certain resistance was noted, which served to give an idea as to the position and length of the stricture, and also whether there was more than one stenosis.

In the case given there were two strictures, 5 cm. apart. At first he used olives of from 3 to 7 mm. diameter. Then the olives of smaller size were left off and the larger ones added to the string as needed. After the size of 11 mm. passed through readily, longer intervals (two or three days, and later two weeks) were allowed to elapse. In the meantime, the child had for some time eaten solid food-bread with the crust without any difficulty. Therefore, the stomach drain and the threads were removed. The treatment was completed before the end of six months. The child continues in good health and has no trouble in eating any kind of food. The gastrostomy, which was performed before the case was referred to Henle, healed spontaneously.

Vinson[7] reported on esophageal stricture following the vomiting of pregnancy. There have been six cases in the Mayo clinic since 1911. There was probably a spontaneous rupture of the esophagus following prolonged periods of vomiting. Whether or not esophagomalacia, described by Zenker and Von Ziemsen in 1878, is the responsible cause for the condition is debatable. All of their cases occurred in males who had induced vomiting over long periods of time. No reference was made to a similar condition in females. In these six cases one died with a streptococcus infection, and the other five were dilated and recovered. Gastrostomy and dilatation was done in four cases, and dilatation alone in two.

Fonio[8] reports a successful case of construction of a plastic antethoracic esophagus. He says that the use of a skin tube, made as long as possible with shortest possible segment of intestine to bridge the gap, has reduced the danger of esophagoplasty to the minimum, while restoring excellent function of the gullet. He says we are fully justified in proposing this operation after systematic efforts at dilatation in all benign cases of impassable stenosis. Several surgeons have had more than one successful case to their credit. He also gives a summary of the other methods and instances found in the literature.

Tiesenhausen[9] succeeded in suturing the esophagus in seven cases after resection of a diverticulum or other operation on it. Different methods were used in the experimental work and clinical cases, and four healed without fistula. The suture in tiers was taken first in the submucosa, turning in the mucosa, using catgut. To promote healing the esophagus was left entirely at rest for a time, feeding with alimentary enemas or through a stomach fistula.

Kimmel[10] had two cases where intrathoracal esophagoplasty was done, although the operation proved a failure in both cases. They teach that a reliable differential pressure is indispensable. The feasibility of mobilizing the stomach and drawing it up to suture it to the oral stump of the esophagus has been amply demonstrated, as has also the advantages of this technic in many respects. It takes comparatively little time; does not require a mutilating operation for access; the suture is made outside the chest, and the whole procedure is complete at one sitting.

Lotheissen[11] refers to plastic operations, in which the stomach is drawn up to make the new esophagus. He tabulates a total of 44 plastic operations for stenosis of the esophagus which were not completed, and 45 cases that were completed. The jejunum was used in 25 and 34 cases in these groups, and the stomach in 17 and 4. The plastic operation was undertaken for cancer in 41 cases but was completed in only one case, and this patient died not long after. The total is thus 130 cases. He has applied the stomach method in 4 cases of stenosis from lye, and reports success in 2 of them. The stomach answered the purpose well in all, and he is thus responsible for two of the three permanent successes with this method out of the 19 in which it has been tried. He also reviews his experience and that of others with other methods.

Engelbrecht[12] reports a case in which twenty different operations were required in turn. The mistakes in this case confirm the advantage of forming a tube from the skin, reaching from the larynx to a fistula in the stomach. As soon as this is healed, the upper end of the tube is sutured to the upper stump of the esophagus. A rubber tube is used to connect the skin tube with the stomach fistula. When entirely healed, a skin flap tube is made to bridge the gap, and the rubber tube is discarded.

Levy[13] recalls that he was a pioneer in experimental research in this line thirty years ago. Of all modes of access, that through the back, with resection of ribs on the left side, gives most ample access to the thoracic portion of the esophagus. He illustrates the various steps of the operations. After resection of the esophagus and cardia, the stump of the esophagus is drawn out through the skin; the diaphragm is sutured to the chest wall, and a wisp of the stomach is brought out through the chest wall below. An autoplastic tube to connect the esophagus and stomach is then constructed. He has found the whole technic feasible and satisfactory in dogs and on cadavers. The reconstructed esophagus lies close to the back, outside of the pleura, and its direction and course are like those of the normal esophagus.

Hirschmann's[14] seventeen illustrations show the various complications liable with an extrathoracic esophagus, and the means to avoid and correct them.

The special feature of Gregoire's[15] technic is that the pleura and peritoneum are left intact. The incision is in the left side of the back, near the spine, running from the seventh nearly to the twelfth rib, and then curving forward. This flap being lifted up, and the diaphragm incised and turned back, exposes the entire cardia, fundus and esophagus. Three cases are described with illustrations.

Palugyay[16] gives the results of tests of a woman with rebellious cardiospasm, compelling the short-circuiting of the passage. Heyrovsky's technic was applied, and the outcome is highly satisfactory. No regurgitation occurs even with extreme tests.

Rovsing[17] has decided that there is no necessity for making the new esophagus from a segment of bowel or the stomach. These unnecessarily complicate the procedure, as a new esophagus answering the purpose can be made out of two long skin flaps, turned back over a long large drainage tube. The flaps are sutured together with catgut on the median line, from neck to stomach. The skin beyond is loosened and drawn up to suture together over the whole. In the woman illustrated, Rovsing waited six weeks for the parts to heal before he united the upper stump of the esophagus to the new skin tube. Five different operations between Feb. 17 and Aug. 6, 1921, were required; then the patient was discharged in excellent condition. She eats with a good appetitie, has gained twenty-six pounds, and can be considered completely cured. Rovsing has applied the first two or three steps of the procedure in two other cases still under treatment. He severs the esophagus and brings the peripheral stump out through a minute incision beyond the sternocleidomastoid muscle. This does away with the pocket above the atresia, in which food and secretions stagnate. Rovsing regards this as an essential improvement over other methods, all of which bury this stump.

Torek's case in 1913 was the only successful one of resection through the posterior mediastinum for cancer, according to Lilienthal,[18] who also reports a successful case. He used the left extrapleural route, where there was a carcinoma two inches above the cardia. The anesthetic used was nitrous oxide-ether. A skin flap was made, and no gastrostomy was done. The patient was fed through a tube. The stricture had to be dilated.

Four other cases of Lilienthal's terminated fatally, three due to infection of the mediastinum due to injury to the diseased esophagus while attempting to isolate it. One case of unexplained death was inoperable. He concludes that the operation is best done in two stages. At the first, the esophagus is freed from its attachments and the mediastinum is sealed. At the second, ten to fourteen days later, the resection is performed.

Bidgood[19] gives a study of the procedure in resection of the esophagus. He considers it from the standpoint of microscopic and structural anatomy, in relation to the difficulties and dangers of the operation. He says the skin tube method gives the best results, and gives a table of twenty-five cases from the literature with the results and methods used.

An article by Allen[20] treats of experimental reconstruction of the esophagus with autogenous fascia lata transplants. He decided to allow adhesions between the fascia lata and esophagus before resection. An outer and an inner tube of fascia were constructed, with outer tube the longer. This two-stage operation prevents leakage, but usually results in stenosis, which might be obviated by dilatation. He finds that this tube comes to be lined with squamous epithelium.

Neuhof and Ziegler[21] report a granulation tube method in two stages as being successful. In the first stage, the section of the esophagus to be removed is isolated, and in the second stage it is resected and a rubber tube is implanted. A granulation tube forms with epithelial overgrowth from the esophageal ends, beginning in one week and becoming extensive at the end of three weeks.

The longest period of observation was seven months after the operation. In this case the new-formed tube was well developed and completely lined by esophageal epithelium. A partial stenosis appeared soon after operation, but was not progressive. The method is advocated as applicable for reconstruction after resection for cancer.

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Report on Antistreptococcus Serum. Of twenty-five leading surgeons, gynecologists and obstetricians who were questioned by Emil Novak, Baltimore (*Journal A. M. A.*, Jan. 16, 1926), as to their opinion of antistreptococcus serum, sixteen considered it of no value, one said he knew nothing about it, and eight expressed the opinion that, while usually unsatisfactory, it might for certain indications be of real value. The chief of these was for a supposed protective or prophylactic action, while occasional good results are mentioned where the proper strain of streptococcus happens to be selected. Not a single one of the twenty-five questioned evinced any degree of enthusiasm for the serum.

CONGENITAL STENOSIS OF THE ESOPHAGUS

REPORT OF TWO CASES

John H. Fitzgibbon, M.D.
PORTLAND, ORE.

Congenital malformations of the esophagus are rare and usually incompatible with life. An occasional case, however, may be treated with varying degree of success. The two cases to be reported are of simple congenital stenosis, without apparent malformation of the air passages.

The first is that of an infant, referred by Dr. E. J. Labbe in April, 1924. Soon after birth an apparently complete stenosis of the esophagus was discovered. Gastrostomy was performed by Dr. Rockey in hopes that steps might later be taken to open the normal passage. Tenacious mucus, which collected in the pharynx, caused difficulty in breathing and frequent coughing . This was overcome to a certain extent by periodically removing the mucus with a small rubber syringe.

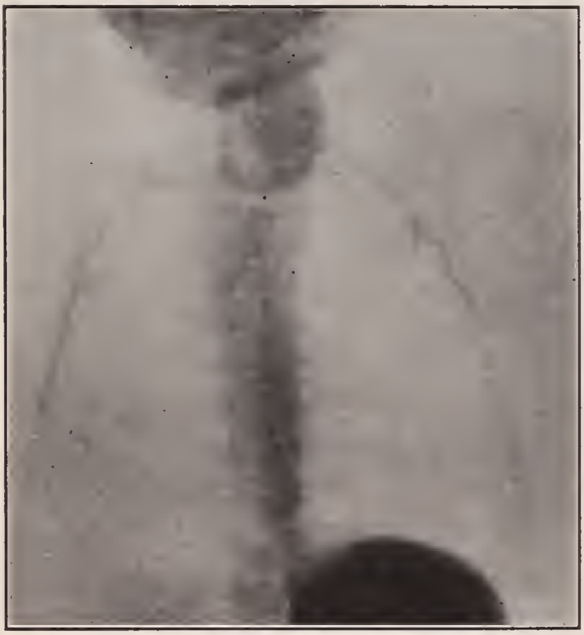


Fig. 1. X-ray picture, showing congenital stenosis of esophagus.

One day, in a spell of coughing, tiny particles of milk curd were expectorated, and gave the first sign of a communication between the upper and lower ends of the esophagus. X-ray examination showed that the pharynx ended in a small pouch, and that the lower segment of the esophagus tapered from below upward, toward but not reaching the upper pouch. No communicating channel could be seen between the upper and lower esophagus (fig. 1.).

Esophagoscopy was performed by Dr. Kistner, who attempted to find an opening. This was unsuccessful. Following this, Dr. Eugene Rockey introduced a cystoscope into the stomach, and by passing it up the esophagus was able to pass a ureteral catheter from below. A silk thread tied to the catheter was drawn out through the mouth (fig. 2.)

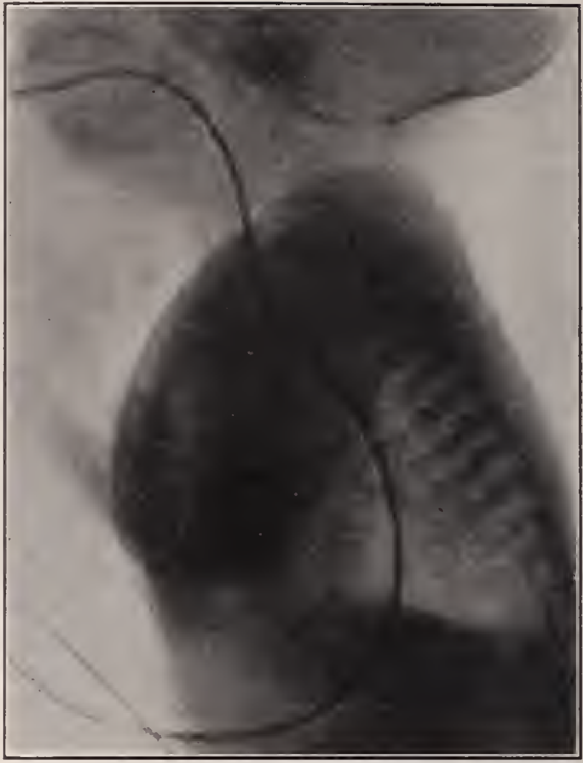


Fig. 2. Ureteral catheter passed through stricture.

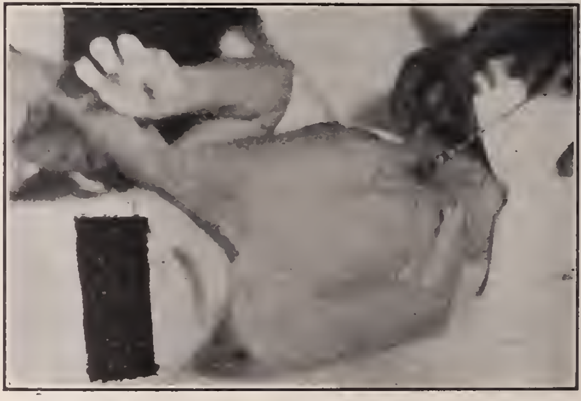


Fig. 3. Dilating stricture through gastrostomy opening.

With the thread as a guide, dilation of the stricture was started, when the child was eight weeks old. Using the olive bulbs and piano wire guide devised by Sippy, the dilating bulbs were passed through the gastrostomy opening and up the esophagus (figs. 3 and 4). On the first day bulbs Nos. 10, 11 and 12 French were passed. Five days later, Nos. 10, 12, 13 and 14 were passed. By slowly increasing the size of the bulbs, the opening was gradually enlarged to No. 20 French between April 3 and July 10.

The mother had meanwhile maintained the supply of breast milk, and the child was being fed by mouth, as well as through the gastrostomy tube. Late in July (two weeks after the last dilatation), the child suddenly developed pneumonia and died. There was no autopsy.

The second case is a boy, age 14, referred by Dr. Wm. Holden, June 11, 1925. Difficulty in swallowing had been marked since birth. Seven years ago gas-

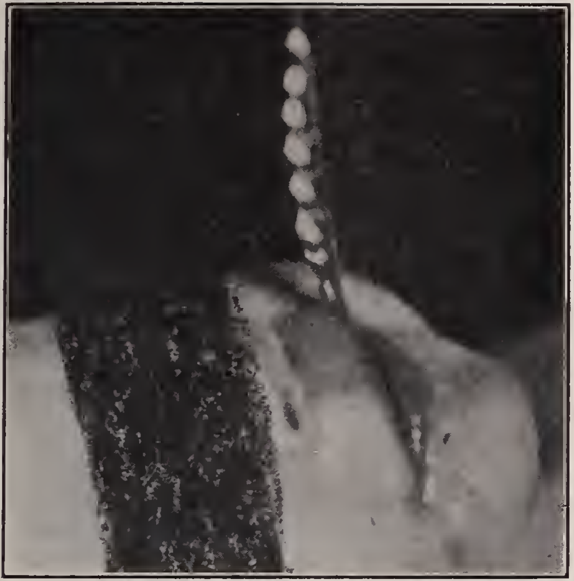


Fig. 4. Dilating bulbs after passing through stricture.

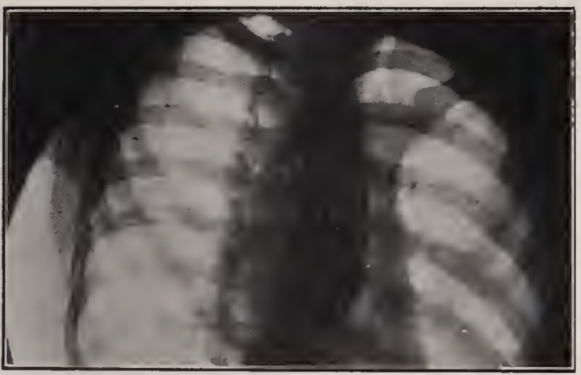


Fig. 5. Congenital stenosis of esophagus in child, age 14.

trostomy was performed, but has since closed. Six years ago the stricture was dilated. When first seen, he had been living on liquids and very soft foods which were swallowed with great difficulty. During the previous twenty-four hours he had been unable to swallow even liquids. Except for marked malnutrition and small size physical examination was negative. A bougie was passed, and met obstruction ten and one-half inches from the incisor teeth. X-ray showed complete stenosis at this point, with moderate dilatation of the esophagus above (fig. 5).

As the patient had been without solid food for some time and without liquids for twenty-four hours, it was decided to attempt the passage of a small wire guide without a thread. This was successfully done, and the resulting passage enlarged to No. 13 French. The following day, Nos. 13, 14 and 15 were passed. During the next twelve days, he gained seven pounds. The passage has since been dilated to No. 24 French, and food of all kinds can be swallowed with ease. Further dilatation can be accomplished at less frequent intervals, as he is no longer suffering from lack of food. The obstruction in this case is evidently due to a congenital web, for the stricture is very short and offers slight resistance to the bulbs.

706 Stevens Bldg.

A BIOLOGIC METHOD OF TREATING CHRONIC SUPPURATIONS

MAX THOREK, M.D.
CHICAGO, ILL.
Surgeon-in-Chief, The American Hospital.

Surgeons are only too well aware that the purely mechanical surgical treatment of chronic suppurations, especially those of the long bones, generally gives poor results. To pursue infecting organisms into recesses and ramifications, where they might have penetrated though not manifest, would necessitate vast and most mutilating operative procedures which would not perhaps be justified; on the other hand, limited excisions do not remove all foci of disease and leave the patient exposed to the necessity of repeated palliative operations and perhaps to an existence of chronic incapacity and invalidism.

In addition to the surgical removal of manifest foci of suppurative processes, some biologic method which would marshal the resisting powers of the organism and aid in the struggle against localized infecting agents is the desideratum. The necessity for such aids has led to the employment of various methods, antiseptic, germicides, dyes, etc., but all these have been found deficient, inasmuch as there is a mechanical difficulty in bringing the agent into contact with the focus of suppurative process, or else the agent does not fulfill the necessary requirements of low toxicity, a high germicidal index, and freedom from effects which tend to delay or inhibit natural regenerative processes.

The aluminum-potassium-nitrate compound method of treating chronic suppurative processes which I have fully described in previous publications[1] is believed to possess all the qualities necessary in a biologic agent. It has no toxic effects and it tends to promote natural regenerative processes within the body. It does not, however, act as a bactericide or germicide, its actual effect being rather to promote the growth of organisms when it is added to culture media. Moreover, it is not necessary that it should be brought into actual contact with pathogenic organisms, its effect being to initiate phenomena which lead to diminution of virulency and vitality of the organisms by which they are ultimately overcome.

In the American Hospital, where the aluminum-potassium-nitrate method of treatment has now been in use for a considerable time and more than one hundred chronic suppurative cases subjected to it, sufficient experience has been gained in regard to the clinical value of this agent to warrant definite conclusions regarding its indications and what may reasonably be expected from it. These results have been so excellent and so generally consistent that they have exceeded expectations, and it is no exaggeration to describe them as marvellous, when compared with the results previously obtained in the same class of lesions by surgery and other curative methods.

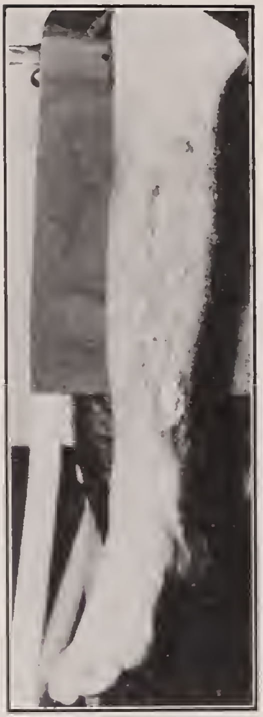


Fig. 1.

The biologic action of this remedy appears to depend primarily upon dialyzation through the skin and an effect produced thereby upon the pathologic tissues, which seemingly is due to released oxygen, i.e., nascent oxygen.

Clinically, after the application of a dressing of aluminum-potassium-nitrate over a skin area covering a suppurative area, there are three well marked reactions; one in the skin outlining the area, one in the diseased tissues themselves and one which is a general systemic effect (fig. 1). The skin reaction, which is always limited to the suppurative underlying area, is a typical erythema, followed later on by the appearance of vesicles and pustules which discharge pus as long as the underlying suppurative process persists. When this reaction no longer appears, it is a sign that the suppurative process has healed.

The effect produced on the deep lying pathologic process is, as has been said, due to dialyzation of some element of the nitrate compound through the skin. The immediate effect is an increased leucocytosis and phagocytosis which is very evident when there is a discharging sinus. There is also a great increase in the propagation of bacteria. But the important therapeutic fact is that the virulence and vitality of those pathogenic agents are reduced in proportion to their increased propagation. These facts have been proved repeatedly both experimentally and clinically (fig. 2).

The third reaction is a general systemic improvement which can be accounted for only by the rapid and increased elimination of toxic products that were absorbed before the institution of the nitrate treatment. It is a very remarkable thing to observe in an old osteomyelitic discharging sinus, that, soon after the application of an aluminum-potassium-nitrate dressing, the previously thin serous discharge is changed into a marked purulent discharge, containing a very large number of polymorphonuclear leucocytes and tissue shreds.

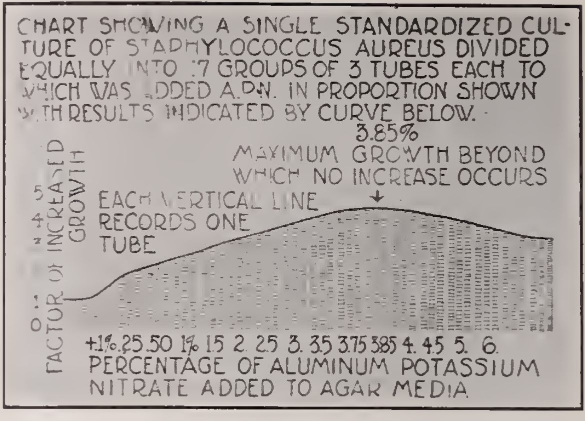


Fig. 2.

The therapeutic results from this method of treatment of chronic suppurations have been most gratifying since the introduction of the method in the American Hospital, more than one hundred cases having been treated. These were of all degrees of severity and many were old rebellious cases of many years standing which had resisted surgical and other treatments. About half the cases treated were mixed infections, the predominating organisms being the staphylococcus aureus, the streptococcus, the bacillus pyocyaneus and various saprophytes. About one-half of the cases were osteomyelitis, both traumatic and hematogenic, with or without discharging sinuses; the remaining half comprised cases of bone tuberculosis, where secondary infection was an added complication, furunculosis, gangrene, etc.

Improvement soon after the treatment is commenced is frequently startling. Pain, which before treatment is often excurciating, soon abates. This is explained by relief of tension; later on muscles, tendons and all other tissues in the vicinity resume their normal flexibility and appearance, and function is often restored to a surprising degree and in an astonishingly short space of time.

The clinical evolution of cases may be clearly seen by a study of the accompanying illustrations which are typical of the general run of the cases treated and are not particularly selective. These

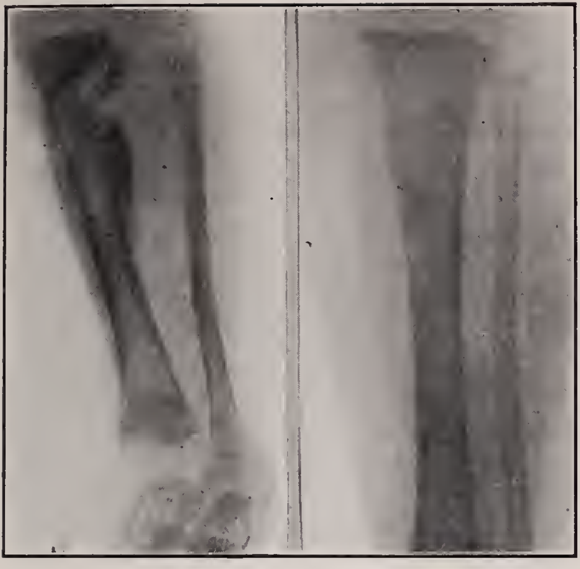


Fig. 3, a: No. 783. Female, age 5 weeks. Osteomyelitis of tibia. X-ray taken before treatment, Oct. 18, 1924.

b. X-ray taken after 62 days of A. P. N. treatment, Dec. 20.

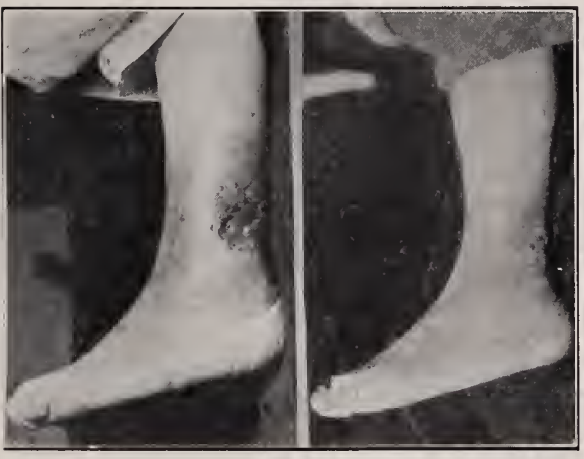
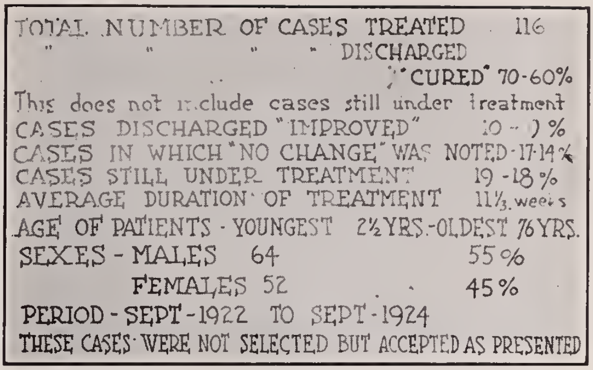


Fig. 4, a: M. P. No. 20012. Female, age 52. Osteomyelitis of tibia and fibula. Superficial appearance of trophic area at beginning of A. P. N. treatment, March 23, 1924.

b. After 30 days of A. P. N. treatment, April 24.

illustrations are self-explanatory and do not call for any elucidation (figs. 3 and 4).

About 75 per cent of the cases treated became ambulatory and able to pursue their vocations, coming to the hospital for dressing only. In more than 50 per cent a clinical cure was obtained which has persisted. Recurrences are very rare, and in only a very small percentage of the cases did the treatment fail to obtain a great improvement (fig. 5). That such results as these, when compared with the purely surgical treatment of such lesions as old-standing chronic osteomyelitis, should be considered as remarkable goes without saying. The treatment offers a new era of hope for unfortunate patients with lesions of this type.



TOTAL NUMBER OF CASES TREATED 116
" " " " DISCHARGED
" " "CURED" 70-60%
This does not include cases still under treatment
CASES DISCHARGED "IMPROVED" 10 - [illegible] %
CASES IN WHICH "NO CHANGE" WAS NOTED - 17-14%
CASES STILL UNDER TREATMENT 19 - 18 %
AVERAGE DURATION OF TREATMENT 11⅓ weeks
AGE OF PATIENTS - YOUNGEST 2½ YRS. - OLDEST 76 YRS.
SEXES - MALES 64 55%
FEMALES 52 45%
PERIOD - SEPT - 1922 TO SEPT - 1924
THESE CASES WERE NOT SELECTED BUT ACCEPTED AS PRESENTED

Fig. 5.

The aluminum-potassium-nitrate compound treatment may be used both as a pre- and postoperative procedure. The treatment is not suggested as a substitute for rational surgery, when such is indicated as in the acute fulminating types of infection or in chronic conditions with clearly defined areas amenable to surgical interference. The nitrate compound treatment is indicated in old chronic infective processes and especially such as have not yielded to previous surgery. In many of the cases treated, where the indication was for surgical treatment, the nitrate treatment was initiated as a preliminary to surgery, but it was remarkable that in a majority of these the progress was so rapid that surgical operation was obviated. But in any case the preoperative use of aluminum-potassium-nitrate compound enables the surgeon to work under more favorable conditions and makes the surgery more effective. As a postoperative dressing also it supplements surgery, checks infection, shortens hospitalization and obviates successive operations for recurrence.

By the judicious use of this therapeutic agent in cases of chronic suppurative processes the surgeon may with confidence expect satisfactory and permanent results in a class of operations which have always yielded the poorest results even to the best executed surgical efforts.

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NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho and Montana

Devoted to the interests of the Medical Profession of the Pacific Northwest

Editorial Office, 543 Stimson Building, Seattle, Wash.

FEBRUARY, 1926

EDITORIAL

THE NARCOTIC SITUATION

The writer recently returned from a trip in the East, including Washington, D. C., New York, Baltimore, Philadelphia, and Chicago, the object being to investigate the narcotic situation with a view of determining the probable number of addicts and what could be done to improve conditions as they exist today. The most reliable statistics obtainable were furnished by the Public Health Service and the Treasury Department which figure the number of addicts at about 115,000. From a national survey it was learned that on the Pacific Coast morphine is the principal drug used, whereas on the Atlantic Coast heroin is employed almost to the exclusion of morphine and that cocaine is used frequently by both classes of addicts.

In New York City Dr. Carleton Simon, Fourth Deputy Police Commissioner, has a very complete record of narcotic addicts, not only including the United States but from all over the world. These consist of photographs and finger prints of all cases that have a court record. It was the unanimous opinion of all who have had experience in the treatment of addicts that they are incurable, except for a very small percentage of cases. They can be made more comfortable under treatment; in fact the addict may be entirely weaned from his drug, but as soon as any crisis comes into his life he will relapse, because he is not a normal person. He was not normal before addiction nor ever afterward.

The study of 225 cases in the service of Dr. Lawrence Kolb, Public Health Service, included men and women from all walks of life. In the study of these cases and of the criminal records in other cities, one is forced to the conclusion that there is no foundation in fact that murders, daylight robberies, hold-ups, etc. are carried out by men under the influence of heroin, morphine or cocaine. It is possible to conceive of men committing robberies for the purpose of securing drugs, when a supply is not available, but the immediate effect of indulgence in all forms of the drug is to steady abnormal impulses, while the stimulant effect is to create a state of idleness and dependency which naturally enhances the desire to live at the expense of others, and by antisocial means the effect of addiction on the murderer is to inhibit his impulse to violent crime. At the same time, it saps his vitality and reduces the ambition and courage that prompt him to convert his abnormal impulses into action. Therefore, he becomes less a murderer and more a thief.

The Army and Navy findings are the most important in indicating that the youth of the country are not addicted in great numbers. This survey differs from others, in that it was confined to one sex and a particular age group so, if the figures were applied to the entire population, it would show about 99,500 addicts in the United States. It is known that addiction in children below fifteen years of age is practically nil.

It becomes necessary, therefore, before using the Army-Navy figures for general application, to ascertain the relative rate of addicts of the two sexes and of the age groups between 18-30 and 30 upwards. Dr. Bailey of the Army states that the military age is the age of election for drug addiction and that there are more men than women addicts. This holds true for the United States as a whole. The greater number of addicts in prison at present, as compared with former years, is due to the rigid enforcement of recently enacted laws and not to an increase in the prevalence of addiction.

The addict's average daily dose of the opiates, in terms of morphine sulphate or heroin hydrochloride, is not less than six grains. The dose of cocaine hydrochloride is practically the same. The quantity of narcotics imported by this country at the present time is believed to be only slightly in excess of the amounts required to supply medicinal needs, and the smuggler and narcotic peddler are the menace of today. As to the relation of intelligence, all classes are reported but possibly 90 per cent are either feeble-minded, neurotic, high or low grade morons, and those whose mental instability is such that if cured they would relapse, if a new crisis came into their lives as noted above.

Dr. C. W. Woodward, Chairman of the Narcotic Committee of the American Medical Association and head of the Legal Bureau in Chicago, and the writer went over the subject very thoroughly, taking into consideration the laws of the various states and their adaptability for the treatment and control of the narcotic addict. Dr. Woodward was of the opinion that Washington State has the best law for the control and care of the addict of any in the United States, that it is possible and, so far as the law goes, is strictly within its requirements that any doctor may treat addicts at any time. A decision of the United States Supreme Court, handed down in a case on appeal from a doctor in Spokane, Linder vs. the United States, tells just what the Harrison Narcotic Act can and cannot do. This is known as Document 183, October term, 1924.

The opinion of the Supreme Court, handed down by Mr. Justice MacReynolds, among other things says, "Congress cannot under the pretext of executing delegated power pass laws for the accomplishment of objects not intrusted to the Federal Government. . . . A physician cannot be prosecuted under the Harrison Narcotic Act, which is a pure revenue measure, for delivery to an addict for self-administration of four small tablets of morphine or cocaine for relief of conditions incident to the addiction."

Obviously direct control of medical practice in the States is beyond the power of the Federal Government. Incidental regulation of such a practice by Congress cannot extend to matters plainly inappropriate and unnecessary to reasonable enforcement of a revenue measure. This decision restores to the physician the rights that have been denied to him and he is at liberty henceforth and for all time to treat the addict in any manner which seems best suited for relief and cure of these unfortunate people. All should become familiar with the Beeler Act and proceed accordingly. I. C. B.

THE MENACE OF SMALLPOX

For a number of years national and state health officers have predicted the approach of a widespread epidemic of smallpox, greater than has been experienced during recent years. The reason for such belief has been the growth of a generation, among whom is an excessive number of individuals unvaccinated as the result of the influence of christian scientists and other antivaccinationists, supplemented by a general indifference to revaccination on the part of many older people throughout the country. During the past few years there has been evidence of a confirmation of this prediction. Reports from all parts of the country indicate an increased number of smallpox cases with a marked exaggeration of virulence. All cities of our Northwestern states report monthly increases of cases and deaths.

A recent bulletin, issued by the United States Public Health Service, reports 50,000 deaths from 62 countries during 1924, as compared with 45,000 during 1923. Reports from 35 of our states during 1924 show an increase of 35 per cent in the number of cases, and 628 per cent in the number of deaths as compared with 1923. The smallpox case-rate in the United States is at present the highest of any civilized country in the world. At the same time it is noted that many of these cases have been of mild type and that smallpox is beter reported in the United States than most any other country. The probability is that this increase will continue until public sentiment is aroused to a thorough realization of the absolute protection from vaccination, when there may be a public demand for its universal enforcement.

THE POS MACHINE FOR HYPERTENSION

Considerable newspaper publicity has recently been given to the invention of a machine which was said by its inventor, a resident of Portland, to reduce blood pressure. The machine is an electrical device somewhat resembling a radio receiver which is said to transmit waves through the air, directed by two movable pointers. It was claimed by the inventor that it is necessary to have one of these pointing absolutely at the center of the neck and the other at some lower portion of the body, because the waves are so accurately directed. There is a difference between the sexes, so that the machine has to be adjusted differently for each sex.

Believing that laymen should be encouraged to go to organized medical bodies when they think they have made a discovery, Mr. Pos was invited to present his machine before the visiting physicians' association of the Good Samaritan Hospital. In order that he might have an impartial examination and study of his machine, a committe of five was appointed by the chairman of that body to make such an investigation. Of this committee four were never permitted to examine the machine. Mr. Pos called upon one of the four who expressed a willingness to make a thorough investigation and outline his idea of such an investigation. At the time of the interview he promised this opportunity but the member of the committee has not seen or heard from him since. Statements were given to him by some of the physicians who had had an opportunity of seeing the machine used, but had not made an examination to determine whether it was electrically sound. These statements were later used by him in the newspaper publicity which he obtained, although it was stated he was not given permission to use them.

The whole thing illustrates the importance of care on the part of physicians relative to making statements as to the value of various therapeutic measures. It would require a much more thorough investigation than was made by any one to determine whether this machine actually did have the power of producing immediate lowering of blood pressure. Then, granted that it had this possibility, whcih was by no means proved, it must be determined whether it is of any real value. The rise in blood pressure is but a symptom like fever, and transitory lowering of the pressure is of no more curative value than the transitory lowering of fever by some drug; in fact, in the latter case damage may be done by other properties of the same drug. Following the newspaper publicity, many if not all of the physicians in Portland were consulted by patients, having or believing that they had hypertension. In some instances it was pathetic to see patients grasping for this like a drowning man for a straw. The medical profession should always be ready to lend a sympathetic ear to the layman who believes he has made a discovery, but in doing so, care and discretion should be used not to encourage erroneous ideas in the good intentioned individual or encourage false hopes among unfortunate incurables.

PACIFIC NORTHWEST MEDICAL ASSOCIATION

The fifth annual meeting of Pacific Northwest Medical Association will be held at Spokane, in the Marie Antoinette room of the Davenport Hotel July 1-3. While it was decided at the last meeting of the Association in Portland to have the 1926 meeting at Glacier National Park, it has become necessary to change the meeting place to Spokane because the hotel authorities in the park did not feel they would have accommodations comfortably to care for so large a meeting as that of this organization.

Those who remember the first meeting of the Association at Spokane will recall that they were well cared for, well housed, well entertained, and that a stellar program was offered. The same is to be expected this year. Thus far the following speakers have been obtained: Dr. Arthur Steindler, Professor of Orthopedic Surgery at Iowa University; Dr. W. R. MacAusland, orthopedist of Boston, Mass. These two men willl appear before the Pacific Northwest Medical Association and will also give special papers before the Pacific Northwest Orthopedic Society which will meet jointly with the former.

Dr. J. Whitridge Williams, Obstetrician-in-Chief of Johns Hopkins Hospital and Professor of Obstetrics at Johns Hopkins Medical School, will give three addresses on obstetric subjects.

Dr. Howard C. Naffziger, of San Francisco, Calif., will give two lectures on neurologic surgery.

Dr. J. B. Collip, Professor of Biochemistry at the University of Alberta, will present an original contribution on parathyrin and two other papers on either biochemistry or internal secretions. Dr. Collip was associated with the Toronto group in the discovery of insulin and is the man who made it possible to produce it in commercial quantities.

Dr. A. W. Adson, of the Mayo Clinic, will return to present two papers on neurologic surgery or possibly give a clinic on neurologic cases, in association with Dr. Harry Lee Parker, also of the Mayo Clinic, who will present two lectures on neurologic subjects.

Dr. Howard Lilienthal, of New York City, will present two lectures on surgery of the chest. Dr. Lilienthal is an international authority on this subject.

Dr. George Dock, formerly of Washington University and University of Michigan, will be the principal speaker on internal medicine. As one of his subjects he has chosen a discourse on the anemias.

Dr. George Semken, of the New York Skin and Cancer Hospital, will present three lectures on surgery in carcinoma.

A number of other notable internists and surgeons are being corresponded with and will be announced from time to time in these columns.

JUSTIFICATION OF BASIC SCIENCE ACT

The Basic Science Act, passed by the recent session of the Washington legislature, vetoed by the Governor, passed by the Senate over his veto, and failing by three votes to pass the House, was a public health measure. Its opponents charge that it represented a conspiracy on the part of the "medical trust" to suppress their competitors, such as chiropractors and sanipractors. In reality its purpose was to require, through an examination before a nonmedical board, a demonstration on the part of those seeking license to heal the sick that they possess reasonable knowledge in the fundamental principles regulating health and disease of the human body.

The letter appearing below is indicative of the mental caliber of certain individuals licensed by law to practice upon the citizens of this state. Under the administration of the vetoed bill, a check would be placed upon the increase of practitioners possessing this sort of brain substance. This letter was received by a Seattle physician from a sanipractic practitioner. It is reproduced verbatim as inscribed by the writer. His professional card was included in the letter.

> **Dr. J. H. Stewart's Mystic Cure**
>
> **For Germ and Acid Diseases**
>
> **SANIPRACTIC PHYSICIAN** **Chehalis,**
> **16 Years in Spine Work, Massage** **Wash.**

Chehalis, Wash.,
Dec. 31/25

Dr H. B. Thompson
Specialist
Cobb Building
Seattle, Washington

Dear Doctor,. I Came To Know Of You Through A Case Mrs. J. L. T.— 303 Courtland St Centralia, Wash. They Told Me Of Calling On You For An Examination & Your Assistant,.

Doctor They Say You & Associates Claimed Nothing Could Done In This Case At All In Your Practice,. KNOWING This I Asked For Your Address,. I Am The Inventor Of Harmless Solution When Applied On Towels & Then The Towels Hot Put Around The Patient & Left One Hour & 15 Min. It Has Stopped Every Fever Case It Has Been Put On In One Or Two Treatments, Fevers 104 Child Screaming In One Hour Fever Gone,. Not Only Fevers, But This Mrs J. L. T. Is Nearly A Well Woman To Day And This Is The Sixth Treatment, Hur Bowels Are Normal And She Sleeps All Night Long Thare Isant Only Verry Scanty Bleeding, All Dark Blood Has Gone,. This Is Greatest REMEDY On EARTH BARING NONE IN METERIAL HEALING, It Does This Enlarged Tonsils Verry Bad In 5 Treatments The Child Well., Taken Lady In Portland That 20 Doctors Had Failed In Last Ones Feeding Hur Strychnine to the end, they said., HUR PULSE 52 Hardly Could Speak Had Been Sick 9 Mo. & In Seven Treatments This Lady Pulse Was 76 & She Went Back East.,

Just One More Boy 17 Yrs Couldent Talk Nor Eat Nor Could He Even Open His Mouth, For 5 Days He Grew Worse & No Help Could Be Given & They Had Doctor, Or More, With no Relief In Just Two Treatments He Is Well.,. I Could Name Many More My Idea Is Selling This Formula That Taken Me 9 Yrs To Perfect,. It Is Worth One Million Dollars, But Ill Take $300,000 It Will Bring $5 to $50 each treatment And Nothing Can Beat No where No Time,. No Springs On Earth Can To My Knowledge Compare, It Will Take The Stiffest Man And In Fiew Treatments He Will Come Out Dancing,. This is Genuine And True,. I Have Been In Office 16 Yrs & Wish to Retire,. If Not Able To Sell, Will Put in Offices in all cities,. Hope i havent Bored You,.

Dr. J. H. Stewart,
1019 State St.

MEDICAL NOTES

NEW ADVERTISEMENTS

Attention is called to the following new advertisements appearing in this issue. Beton, Dickinson & Co. (page 22) present a new sphygnomanometer. Hoag-Meyer X-Ray Co. (page 3) announce their agency for x-ray supplies. Laboratory Products Co. (page 17) offer information on their products for infant's diet. Hollister-Stier Laboratories (page 8) specialize in hayfever pollens of the Northwest.

New Title for Medical Journal. *The American Journal of Electrotherapeutics and Radiology* which has been published for forty-three years, has changed its title to *Physical Therapeutics*. The editor this journal is Dr. William Benham Snow, of New York, who has been an authority in the development of electrotherapeutics during the past quarter of a century.

Interstate Postgraduate Foreign Clinic Assemblies. The foreign clinics under this designation for 1926 will include Italy, Switzerland, Germany, Austria, Czecho-Slovakia, Holland and Belgium. The members of the party will sail from New York on April 28, a few days after the American Medical Association meeting at Dallas, Texas. At most of these foreign clinics the English language will be spoken, but a director will be on hand at each clinic where interpretation is needed.

A recent article in the *Journal of the American Medical Association* stated that "the Berlin Faculty decides against official welcome to American physicians." It is now explained that this attitude was held by the Faculty of Berlin last fall but conditions have materially changed since that time. It is stated by representatives of the Government and the Faculty of Berlin that the members of the American expedition will receive a most hearty welcome in Berlin this summer. The Managing-Director of the Interstate Postgraduate Assemblies of America is Dr. William B. Peck of Freeport, Ill., from whom detailed information can be obtained regarding the excursion.

OREGON

Portland Academy of Medicine. A notable meeting of the Portland Academy of Medicine was held January 14-15, when Dr. E. Starr Judd, of the Mayo Clinic, and Dr. George F. Dick, professor of medicine at Rush Medical College, presented papers of special interest. Dr. Judd paid special attention to gallbladder diseases, while Dr. Dick discussed the control of scarlet fever. Surgical and medical clinics were held by both of these men.

Veterans' Hospital to Be Built. The Veterans' Bureau hospital, of Portland, which will be started in the spring, will be located at Sam Jackson park on Marquam hill. This is a 25-acre tract, donated to the University of Oregon by Mrs. C. S. Jackson, widow of the founder of The Journal, and her son. This hospital will replace the Hahnemann hospital now under lease for the Veterans' Bureau. The hospital will consist of twelve or fourteen buildings and will have facilities for handling 350 patients. The hospital will cost $1,350,000, and will be one of the largest and best equipped of the Veterans' Bureau hospitals.

Hospital at Indian Agency. A $20,000 hospital is to be built at the Klamath Indian Agency. It will be a fifty-bed institution, one-story frame construction with concrete basement. It will contain the necessary equipment for administrative and other functions.

One Hospital Purchased by Another. Wesley hospital, of Marshfield, has purchased the Smedberg sanitarium of that city, the latter having been in operation during the past five years.

New Wing to be Constructed. Two new wings are to be added to the Salem hospital, which will increase the capacity by 40 beds with space for other hospital departments.

New Hospital Opened. The Morrow General hospital was opened last month at Heppner. It has been constructed by remodeling residence property which has been fully equipped for medical, surgical, maternity and other classes of cases.

Appointed to State Office. Dr. C. J. Smith, of Portland, has been appointed a member of the Industrial Welfare Commission for a three-year's term.

Appointed Superintendent. Miss Grace Phelps, of Portland, has been appointed superintendent of the Doernbecher Memorial hospital for children. For five years she has been superintendent of the Portland Eye, Ear, Nose and Throat hospital and was chief nurse with Base Hospital No. 46 in France. The hospital will be opened about April 15 and will contain 80 beds.

Health Officer Resigns. Dr. L. W. Hyde, of Hillsboro, Washington county health officer, resigned from his office, to become effective Feb. 1. He has held this office for eight years. After having practised in Hillsboro since 1914, he is moving to Astoria for future practice.

Medical Wedding. Dr. A. E. Wrightman, of Silverton, was married to Miss Alta L. Jones, of Mission Bottom, on January 12.

WASHINGTON

Date for State Meeting. The annual meeting of Washington State Medical Association will be held at Spokane, June 29-30, immediately preceding that of Pacific Northwest Medical Association. On the 28th will occur the medical golf tournament. The program for the state meeting has not yet been completed. Details will be published in subsequent issues.

Enabling Act Permits Joint Ownership. Owing to the passage of an Enabling Act by the Washington legislature which was signed by the Governor, it is possible for two counties or for a city and county to jointly erect hospitals. There has been active agitation in Seattle for the construction of a city-county hospital. This act opened the way for the construction of such a building.

Hospital for Indian Children. An effort is being made to get a government appropriation of $25,000 for the construction of a tuberculosis sanatorium near Oakville to care for tuberculous children of Western Washington reservations. It is proposed to combine a sanatorium and school for this purpose. It is stated there are 50 or 60 Indian children who should receive such treatment.

Will Build Isolation Hospital. The Seattle City Council has voted $4000 for a new structure at Firland isolation hospital to segregate virulent cases. Four smallpox cases died there last month, two of them being complicated with other contagious diseases.

Opening of New Hospital. The new wing of St. Lukes hospital, at Bellingham, was formally opened January 6. The hospital has been in existence since 1892, starting with a capacity for twenty patients. The present addition will enlarge hospital facilities to fifty beds, and is being constructed at a cost of $150,000.

New Children's Hospital. A new building for the treatment of tuberculous children has been completed and opened for patients at Firlands sanatorium, Seattle. The building is of reinforced concrete with broad porches on the second and third floors. It contains 60 beds, and was constructed at a cost of $60,000 paid by the taxpayers, as this is a city institution.

Isolation Hospital Contemplated. It is proposed to establish an isolation hospital at Aberdeen for treatment of contagious diseases. It is also suggested that it be erected so as to serve all of Grays Harbor County which is destitute of such service.

New Hospital Opened. One unit of the Yakima sanatorium and hospital building was opened January 4. It is owned by a corporation and open for the use of all licensed doctors of medicine and dentistry. It will be added to as the demands increase.

New Nurses' Home. A nurses' home has been constructed in connection with the Longview Memorial hospital. It is a two-story and basement building, 40 by 30 feet. It will accommodate the nurses' staff, numbering about fifteen.

Infirmary to be Constructed. The Yakima county commissioners have decided to construct a thirty-bed infirmary in connection with the county farm. It will cost about $30,000 and will probably be completed in August. It will assemble together cases that are now treated in various localities.

New Medical Building Opened. The Medical and Dental Building of Everett was formally opened last month. It is the largest office building in the city and will house most of the doctors and dentists.

Returns From Service in India. Dr. Harriett Clark, who practiced medicine for twenty years in Seattle previous to five years ago, has returned home from service as medical missionary at a hospital at Ahmednagar, India. She plans to remain about six months before returning to this work. One is impressed with the superiority of modern hospital provisions in a country like the United States after listening to a description of conditions existing in an Oriental country like India.

Medical Advisor Resigns. Dr. Walter Kelton of Seattle, chief medical advisor of the Department of Labor and Industries, presented his resignation last month. He found that the duties of his office seriously conflicted with professional practice. This action was received with regret by state officials who have been in contact with his work during the past year. His energetic and thrifty conduct of the office has met with the approval and satisfaction of all who have been associated with him.

Pathologist Loses Arm. One day last month Dr. D. H. Nickson, pathologist of Swedish Hospital at Seattle, broke a test tube in his left hand, containing a culture of bacillus aerogenes capsulatus. In the palm was a scratch. Next day the characteristic symptoms of gas bacillus infection were present above the elbow. In order to save his life the arm was amputated at the shoulder.

Doctor Promoted. Dr. J. G. Cunningham, of Spokane, who has been division surgeon for the Great Northern railroad for the past twenty years, has been made assistant chief surgeon for the entire Great Northern Railway.

New Medical Advisor. Dr. L. L. Goodnow, of Aberdeen, has been appointed Medical Advisor to the Department of Labor and Industry, in place of Dr. Kelton, resigned.

Sentenced to Prison Service. Dr. Arvil C. Silverberg, of Seattle, was tried by an Army courtmartial board at Fort Lawton, for desertion in evading the first draft in the World War. He was convicted by this board of six Army officers and sentenced to serve three years of hard labor in prison.

Dr. Wm. E. Gossett, who has practiced in Coupeville for the past two years, has returned to Twisp, where he was formerly located.

Medical Wedding. Dr. August Ghiglione, of Seattle, was married to Miss Katherine Chamberlain of that city, January 12.

IDAHO

Meeting of the Industrial Accident Board. In recent years there has been dissatisfaction and misunderstanding between the physicians of Idaho and the industrial accident board regarding the Workmen's Compensation Law. There has been much criticism of the fee schedule which has not seemed just and equitable. In order that all phases of this subject might be adjusted as far as possible to the satisfaction of all concerned, a meeting was called for February 11, to be held in the offices of the Industrial Accident Board at Boise. Dr. C. W. Pond, president of the state medical association, appointed fourteen physicians from different cities of the state to represent the medical profession at the conference. Any physicians of the state interested in this subject were requested to offer suggestions relative to the fee schedule or other phases of the industrial insurance question. It is expected that the outcome of this meeting will adjust the differences existing in connection with the Workmen's Compensation Act.

Dr. B. O. Clark, who has practiced for the past eighteen years at Emmett, has moved to Lakewood, Ohio, where he will practice for the future. He was formerly a member of the Idaho state board of health.

MONTANA

New Detention Hospital. A new detention hospital has been opened for public inspection at Great Falls. The building was purchased by the county for $7,000 during the past summer and has been remodeled at a cost of $8,000. Separate wards have been prepared for scarlet fever, diphtheria and smallpox patients. Modern provisions have been made for sanitation and the latest hospital care.

Appointed County Health Officer. Dr. C. F. Jump, of Bozeman, has been appointed Gallatin County health officer to succeed Dr. Joseph Piedalue. Dr. Jump is also health officer of the city of Bozeman.

Dr. W. T. Williams, who has practiced for several years in Missoula, has located for future practice at Sand Coulee.

OBITUARIES

Dr. Walter Lovejoy, Baker, Ore., died January 1, at the age of 71 years. He was born in Indiana in 1854. He graduated from the College of Physicians and Surgeons of Keokuk, Ohio. He went to Montana in 1880 and a year later returned to Ohio. In 1886 he located in Wyoming, where he practiced until 1902. In that year he moved to Eastern Oregon and engaged in mining. He lived in Baker County for 19 years.

Dr. George H. Dow, Chehalis, Wash., died December 31, after a long period of illness. He was 64 years of age. He was born in Clarinda, Iowa, in 1861. In 1869 he moved with his parents to Kansas. He attended the agricultural college at Manhattan and later graduated from a medical college in Chicago. He moved to Lewis County in 1889, settling near Randle. Twenty-five years ago he moved to Chehalis, where he lived until his final sickness.

Dr. John Hathaway died at San Diego, Calif., December 28. He was a pioneer physician of Everett, Wash. A year ago he sold his residence as a site for the Medical and Dental Building of that city and moved to San Diego.

Dr. Frank H. Parker died at Missoula Mont., January 10, at the age of 75 years. He was in the leper service of the United States for many years. He located at Hamilton about four years ago.

MEDICAL RESERVE CORPS

To—All Liaison Officers and Members of Medical Reserve Committees, Ninth Corps Area.

1. Herewith is a revised list of all Liaison Officers, and the members of their supporting committees, in the Ninth Corps Area. This is being forwarded for your information.

2. There is also enclosed a statistical table showing the physicians in each state of the Ninth Corps Area, the fair quota of Medical Reserve Officers required from each, and the number and percentage, on December 31, 1925, who are already commissioned or have filed applications for commission.

This table shows not only the needs and status of Medical officer personnel for the whole Ninth Corps Area, but for each state component thereof.

It is earnestly requested that steps be taken to enroll the necessary number of Medical Officers to fill existing vacancies, as organization of medical units is delayed by lack of personnel to fill their commissioned places.

3. Attention is invited to the fact that very effective work toward enrollments can be done by systematized work through County Medical Societies and their Secretaries.

For example, last autumn the Sacramento (Cal.) County Medical Society became sponsor, by Resolution, for the four Medical Reserve units within its limits, and called upon its members to enroll in the Medical Reserve Corps.

The Secretary of that Society then addressed a questionnaire to each individual member, and after three months secured the following results:

Already members of M. O. R. C. or National Guard	5
Willing to join the Medical Reserve Corps	44
Not willing to join the Medical Reserve Corps	44
Over age limit	7
Physically unfit	2
Not qualified; or women	3
Out of town, or no response	11
Total	116

If all County Medical Societies would make such patriotic response as has been the case with the Sacramento County Medical Society and its members, the Reserve Medical officer personnel required from the Ninth Corps Area would not only be promptly enrolled but over subscribed several times.

The following-named reserve officers are assigned to the units as indicated below and to the positions as indicated after their respective names:

84th Evacuation Hospital, 3rd Army:

First Lieutenant Merl L. Margason, Med-Res., 5003 32nd Ave. S. E., Portland, Oregon, as Assistant Chief of Medical Service.

First Lieutenant Charles C. Newcastle, Med-Res., 1401½ Hawthorne Ave., Portland, Oregon, as Surgical Ward Officer.

First Lieutenant Archie E. Bird, Camas, Washington, to 84th Evacuation Hospital, 3rd Army, as Assistant to Chief of Medical Service.

First Lieutenant Laban A. Steeves, Med-Res., 1635 State Street, Salem, Oregon, assigned to the 84th Evacuation Hospital, 3d Army, as Assistant to Chief of Surgical Service.

First Lieutenant Oliver M. Nisbet, Med-Res., 1163½ Albina, Portland, Oregon, as Medical Ward Officer.

85th Evacuation Hospital, 3rd Army:

Major Frederick Epplen, Med-Res., Altadena Apts., Spokane, Washington, as Chief of Medical Service.

Major Joseph Aspray, Med-Res., 823 Cliff Avenue, Spokane, Washington, as Roentgenologist.

General Hospital No. 145, Zone of Interior:

Captain Ferris L. Arnold, Med-Res., 216 Clark Ave., Billings, Montana, as Executive Officer.

Captain Lawrence G. Dunlap, Med-Res., 705 Hickory St., Anaconda, Montana, as Assistant to Chief of Surgical Service.

First Lieutenant Warren E. Tupper, Med-Res., 220 Second Ave., Laurel, Montana, as Evacuation and Receiving Officer.

First Lieutenant Cedric H. Nelson, Med-Res., 243 Hart-Albin Bldg., Billings, Montana, as Medical Ward Officer.

Captain John H. Graham, Med-Res., 210 Hart-Albin Bldg., Billings, Montana, as Surgical Ward Officer.

Captain George A. Baker, Med-Res., Hardin, Montana, is assigned to General Hospital, No. 145, Zone of the Interior, as Surgical Ward Officer.

General Hospital, No. 46, Communications Zone:

Frist Lieutenant Lester T. Jones, Med-Res., 507 E. 59th St. N., Portland, Oregon, as Medical Ward Officer.

First Lieuteant Leo S. Lucas, Med-Res., 29 E. 18th St., Portland, Oregon, as Surgical Ward Officer.

68th Surgical Hospital, 3rd Army:

Major Cline F. Davidson, Med-Res., 509 American Bank Bldg., Seattle, Washington, as Operating Surgeon.

Captain Edward W. Stimpson, Med-Res., 729 High St., Bellingham, Washington, as Assistant Operating Surgeon.

Captain Charles C. Harbaugh, Med-Res., Metcalf St., Sedro-Woolley, Washington, as Assistant Operating Surgeon.

Captain John F. Gibson, Med-Res., Pacific Bldg., Olympia, Washington, as Assistant Operating Surgeon.

Captain Leon L. Goodnow, Med-Res., 335 Finch Bldg., Aberdeen, Washington, as Chief of Medical Service.

Captain Harry W. Shryock, Med-Res., Box 500, Steilacoom, Washington, as Assistant Chief of Medical Service.

Captain John H. Bridenbaugh, Med-Res., 240 Hart-Albin Bldg., Billings, Montana, is relieved from assignment to 69th Surgical Hospital, 6th Army, and assigned to General Hospital, No. 145, Zone of the Interior, as Roentgenologist.

The following-named Medical Corps Reserve Officers having been assigned to the 87th Evacuation Hospital, 6th Army, are assigned within the unit as Assistant to Chief of Surgical Service.

Major Clyde T. Hockett, Enterprise, Oregon.

Major Frank Van Doren, R No. 1, Box 125, Oregon City, Oregon.

The following-named Medical Corps Reserve Officers having been assigned to General Hospital No. 46, Communication Zone, are relieved from their present positions and reassigned within the unit to the positions as indicated after their respective names:

Major Laurence Selling, 510 21st St., Portland, Oregon, relieved from assignment as Assistant to Chief of Medical Service and assigned as Chief of Medical Service.

First Lieutenant Warren C. Hunter, University of Oregon Medical School, Portland, Oregon, relieved from assignment as Medical Ward Officer and assigned as Laboratory Officer.

Captain Ferris L. Arnold, Med-Res., Hart-Albin Building, Billings, Montana, has been designated as Liaison Officer for Medical Reserve Corps affairs for that part of the State of Montana lying east of the Rocky Mountains, and for the entire State of Wyoming. He will be glad to answer any inquiries or give help to any present or prospective Medical Reserve officers or Medical Reserve units within his district. Captain Arnold has been particularly active in getting General Hospital No. 145 assigned to Billings, Montana, in procuring its personnel, and in having the St. Vincent's Hospital in Billings act as the parent institution for this medico-military organization.

Distribution by states of Medical Reserve Corps Officers on December 31, 1925.

STATE	Number of Physicians Registered	Number of Reserve Officers each state should furnish	Percentage of total required	Number of Medical Reserve Officers Enrolled	Percentage Enrolled of total required
California	7549	1243	60.7	550	44.2
Washington	1756	289	14.1	167	58.1
Oregon	1158	191	9.3	149	78.1
Montana	568	94	4.6	71	76.4
Utah	497	82	4.0	89	108.5
Idaho	452	75	3.6	39	52.0
Wyoming	263	43	2.1	30	69.7
Nevada	140	23	1.1	10	43.4
Alaska	60	10	0.5	2	20.0
TOTAL	12,443	2050	100.0	1107	54.0

PUBLIC HEALTH LEAGUES

WASHINGTON

GOVERNOR KILLS HEALTH BILLS

The Basic Science and Law Enforcement bills, having successfully weathered all attacks in the legislature, and having passed both branches with a total favorable vote of 188 to 61—more than three to one—met defeat when Governor Hartley unexpectedly vetoed them.

The Basic Science Bill called for a preliminary examination at the University of Washington in the fundamental healing sciences of anatomy, physiology, chemistry, pathology and hygiene, this test to be taken by all who would apply to practice any method of healing in the state. The Law Enforcement Bill provided that renewal of license fees from physicians, dentists, pharmacists and other professions should go into a special fund, to be used by the attorney general in the strict enforcement of the professional laws of Washington.

Governor Hartley, after promising to sign the Basic Science measure, offered a veto because it would tend to "increase the antagonism between the various healing groups," and would center too much power in the University of Washington. He proved consistent in his opposition to such efforts to protect the public health by also using red ink on the measure to provide effective enforcement of the state's healing statutes. Here he felt that the Department of Licenses was functioning and there was no need of getting the active aid of the attorney general.

The Basic Science Bill was presented to the legislature, after the veto, in an effort to override. Action in the Senate was favorable, the vote being 27 to 10. Three votes were lacking in the House for the necessary two-thirds, the roll call showing 59 for with 34 against.

THE DEAD AND BURIED

A number of efforts were made by cultists to break down healing standards, to cripple medical practice, and to increase the quackery load for Washington. Among such projects were:

S. B. 153, by Conner and St. Peter. This is the joker chiropractor bill. Killed in the Senate committee.

S. B. 201, by Wray and Harrison. This restores sanipractic rights and gives this cult the dignity of a separate board and all the "fixings." Killed by being tabled on the floor of the Senate.

H. B. 46, by Levy Johnson. Mr. Johnson would allow no narcotics to those under 21 years of age. Killed in the Rules Committee of the Senate.

H. B. 106, by Sweetman. One of the sanipractic measures. Would greatly enlarge healing powers of this cult, giving these practitioners nearly all rights of general medical practice. Killed in the House committee.

H. B. 191, by G. W. Thompson. Provided a "wide open" policy for nearly all Washington hospitals by admitting cults of all kinds, makes and models to regular hospital practice. Killed in the House committee.

H. B. 192, by G. W. Thompson. This is the bill to establish English for certain prescriptions, and to require physicians to inform patients whenever any narcotic drug or derivative thereof is to be used. Killed in the House committee.

DOSURINE is recommended as a handy means for qualitative and quantitative urinary tests for albumin and sugar. Laboratory use has demonstrated that the different cases of testing tubes effectively accomplish what is claimed for each one.

REPORTS OF SOCIETY MEETINGS

OREGON

CENTRAL WILLAMETTE MEDICAL SOCIETY

Pres., F. E. Beauchamp; Secty., G. E. Fortmiller

The Central Willamette Medical Society held a meeting at Eugene, January 7, about sixty members being in attendance.

Dr. H. A. Mathieu, of Portland, read a paper on "Induction of Labor."

The following officers were installed for the ensuing year: Dr. F. E. Beauchamp, Albany, president; Dr. W. W. Allen, Mill City, vice-president; Dr. G. E. Fortmiller, Albany, secretary-treasurer.

POLK-YAMHILL-MARION SOCIETY

Pres., E. E. Fisher; Secty., D. R. Ross

Polk-Yamhill-Marion Society held a meeting at Salem, at which the following officers were elected for the ensuing year: President, Dr. W. H. Lott, McMinnville; first vice-president, Dr. L. O. Clement, Salem; second vice-president, Dr. J. O. Van Winkle, Jefferson; third vice-president, Dr. W. L. Pemberton, Dallas; secretary-treasurer, Dr. W. H. Barendrick, McMinnville.

PORTLAND CITY AND COUNTY MEDICAL SOCIETY

Pres., T. H. Coffen; Secty., K. H. Martzloff

A meeting of Portland City and County Medical Society was held at Portland Hotel, Portland, Ore., Jan. 6, President T. H. Coffen presiding. The minutes of the previous meeting were read and approved.

The following doctors were unanimously elected to membership in the Society: Drs. H. W. Steelhammer, A. H. Johnson. Dr. F. E. Boyden was affiliated, being transferred from the Eastern Oregon Medical Society.

Dr. Howard presented a specimen of candle which he had removed from a patient's bladder several days previously.

The first paper was by Mr. Frank and concerned itself with the furnishing of the doctor's office. He brought out the lack of harmony and incongruity which may result from improper color schemes and improperly selected articles of furniture, illustrating how these could be avoided.

The second paper was by Dr. T. H. Coffen, entitled, "The Failing Heart." He described the various factors concerned in cardiac decompensation and stressed the importance of differentiating between coronary thrombi and the so-called anginal attacks. Dr. Brill in discusion called particular attention to the case of streptococcus veridans endocarditis, who is living and in comparative good health two years after the demonstration of the veridans organism in the blood stream.

Dr. C. U. Moore presented the following motion which was unanimously passed: That the Society authorize the formation during the year of such sections as may seem advisable to its officers.

A letter was read from the Women's Convalescent Home Association, calling attention to the fact that the home is open and ready to receive patients.

A meeting of Portland City and County Medical Society was held at Portland Hotel, Portland, Ore., Jan. 20. The minutes of the previous meeting were read and approved.

A motion was voted to omit the reading of the minutes of the meeting held on December 16, 1925, but to approve them.

The names of the following applications for membership having been approved, were read, to be voted upon at the next meeting: Drs. P. B. Cooper, P. T. Neely, Albert Mount, J. R. Montague, J. R. Mizner, O. H. Meissner, C. A. Stuart, M. E. Wilson, A. H. Huycke.

The first paper was read by Mr. W. W. Brown, a specialist in business efficiency. It concerned itself with the business phase of medical practice.

The second paper, "Some Problems in the Surgery of Thyroid Disease," was read by Dr. T. M. Joyce and concerned itself principally with experiences in treatment of somewhat over 1100 cases. Dr. A. C. Smith discussed the paper, followed by Drs. Philo Jones, J. E. Else and E. H. East.

Dr. J. H. Fitzgibbon reported an interesting case of common bile duct obstruction, in which the sodium salt of tetraiodidephenolphthalein was administered. X-ray plates showed dilatation of the gall bladder following the ingestion of food, the operation showing a definite chronic cholecystitis.

WASHINGTON

COWLITZ COUNTY MEDICAL SOCIETY

Pres., E. C. Hackett; Secty., L. S. Roach

The annual meeting of the Cowlitz County Medical Society was held at Longview January 12, at Hotel Monticello. The following officers were elected for the ensuing year: President, Dr. R. E. Windham; vice-president, Dr. J. F. Christensen; secretary, Dr. L. R. Lightfoot; corresponding secretary, Dr. P. H. Henderson. A program committee composed of Drs. J. F. Barton, A. S. Nicholson and P. H. Henderson.

KING COUNTY MEDICAL SOCIETY

Pres., A. C. Crookall; Secty., C. E. Watts

General Meeting January 4, 1926

The General Meeting of the King County Medical Society was held at Seattle, Wash., Jan. 4 at 8:15 p. m., President Crookall presiding. Minutes of December 7 read and approved.

Announcement regarding the legislative vote on the Basic Science Bill was made.

An invitation to members of the King County Medical Society to attend the Portland Academy of Medicine annual meeting was read.

Proposed amendments to the By-Laws of the Society were read as follows:

The dues of members of the Society who are incapacitated for practicing through prolonged illness may be waived at the discretion of the Board of

Trustees, provided, however, that this does not obligate the Society to pay the dues of said members to the Washington State Medical Association.

Expenditure or investment of the building fund, or any portion thereof, of this Society by the Board of Trustees, except by deposit in a savings bank or National bank, or by investment in Federal government bonds, shall in all instances require approval by a majority of the members of this Society present at a regular meeting, providing that notice of such proposed investment shall have been given to each member.

New members were voted on and accepted as follows: Drs. I. J. D. Shuler, F. W. Jones, R. E. Mullarky, R. S. Reed, Victor Cefalu, C. L. Smith, C. A. Regan, W. A. Glasgow, K. H. Beckey, S. Sawamura, K. G. Burns, Paal Torland.

Report of the Legislative Committee was read and accepted, and ordered placed on file.

Report of the Industrial Service Bureau was read by Dr. L. F. Lundy. A supplemental report was read by Dr. H. J. Davidson. On motion, these reports were accepted and ordered placed on file.

It was moved and seconded that the Industrial Service Bureau be discharged, and that the Board of Trustees be empowered to expend not to exceed $500 in liquidation of its accounts. Motion lost.

Dr. P. V. von Phul read the report of the University Extention Committee. Report was accepted and ordered placed on file.

Dr. Charles Shannon read the report of the Entertainment Committee. Report was accepted and ordered placed on file.

Dr. J. C. Snyder read the report of the Membership Committee. Report accepted and ordered placed on file.

Report of City Hospital Committee was read by Dr. von Phul. Report was accepted and ordered placed on file.

Dr. M. F. Dwyer reported for the Program Committee. Report accepted and ordered placed on file.

Dr. D. C. Hall reported for the Goitre Prevention Committee. Report accepted and ordered placed on file.

Dr. O. H. Christoffersen reported for the Credit Bureau Committee. Report accepted and ordered placed on file.

Dr. A. O. Loe reported on the activities of the Public Health League, and especially regarding the Basic Science Bill.

Dr. Downs of Spokane spoke in regard to the Public Health League.

Report of the Secretary-Treasurer was read, accepted and ordered placed on file.

The tellers reported the election of the following officers for 1926:

President, Dr. Walter C. Woodward; vice-president, Dr. C. E. Watts; Secretary-Treasurer, Dr. O. H. Christoffersen; Trustees, Drs. J. H. Snively and C. R. Castlen; Delegates to Washington State Medical Association: Drs. C. E. Hagyard, W. T. Woolley, R. J. McCurdy, G. A. Dowling, J. E. Hunter, B. T. King, J. T. Mason, H. D. Dudley and A. C. Crookall.

The newly-elected President was escorted to the chair, and made a short address.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. F. Dodds; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in its rooms, Tacoma, January 12, 1926. Called to order by Dr. W. B. McCreery, who installed Dr. E. F. Dodds, the newly-elected president. In the absence of the secretary, Dr. C. F. Engels acted as secretary pro tem. Dr. Dodds announced his committees for 1926, and took an optimistic view of the coming year.

Dr. Rich spoke on medical opportunity in America as compared with Europe, and showed that in Europe, due to the fact that a large part of the population is treated either in free hospitals or through associations, private practitioners have very limited opportunities. He reviewed briefly the history of group medicine, an outgrowth of the war. The advantages of this type of practice are that better work is done because it is supervised and conforms to a standard. The disadvantages are the impossibilities of getting men of equal earning power to forget the financial side and be more altruistic.

Dr. C. C. Leaverton read a paper on Protein Therapy in the Treatment of Infections. It dealt with milk protein injections. He reviewed the literature and cited a number of cases in his own experience of gonorrheal epididymitis, prostatitis, salpingitis and pelvic peritonitis in which favorable results had been shown. Dr. J. R. Brown said that the reaction due to the protein produced a pyrexia which destroyed the infective organism. Dr. Doe said that in epididymitis diathermy produced as favorable results without a systemic reaction. Dr. William McCreery had obtained good results in gonorrheal salpingitis.

An invitation to attend the dietetics course at the University of Washington was read and arrangements were made to ascertain if this course could not be given in Tacoma.

The application of Dr. Cyril V. Lundvick for membership was read and referred to the trustees.

Col. Leverton, of the Cushman Hospital, said that the staff at Cushman had regular meetings on the first and third Thursdays of each month at 7:30, to which the members of the society were cordially invited.

Invitation to attend the annual meeting of the Portland Academy of Medicine January 13-15 was read.

Treasurer's report for the year 1925 was read.

SPOKANE COUNTY MEDICAL SOCIETY

Pres., G. A. Downs; Secty., R. L. Rotchford

The annual meeting of the Spokane County Medical Society was held in Spokane, January 14.

Dr. L. B. Kingery, of Portland, gave an address on "Relation of Skin Lesions to Internal Medicine." Dr. Mitchell Langworthy described his portable elevator frame for treatment of fractures of the leg, back and pelvis.

The following officers were elected for the ensuing year: President, Dr. Robert N. Hamblen; Vice-President, Dr. Mitchell Langworthy; Secretary, Dr. R. L.

Rotchford; Treasurer, Dr. Armin Fisher; Board of Censors, Dr. George Downs; delegate to state association, Dr. H. E. Rhodehamel; alternate, Dr. Peter Reid, all of Spokane.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., J. S. Davies; Secty., M. J. Morris

The annual dinner and election of officers of the Puget Sound Academy of Ophthalmology and Oto-Laryngology was held at University Club, Seattle, January 19, 1926. The President, Dr. J. S. Davies, Tacoma, presided. Twenty-one members and three visitors were present.

Dr. Davies, the retiring President, gave a resume of the events which occurred in the Society during his regime. The report is incorporated in the minutes of this meeting. The Treasurer's report was read and an auditing committee was appointed.

It was voted that the Academy year be changed to commence January 1 instead of September 1, as in the past, and that dues for the present year be extended to include the time up to January 1, 1927.

Dr. E. E. Maxey of Aberdeen was elected to membership.

The following officers were elected for the ensuing year: Dr. E. F. Chase, Seattle, President; Dr. J. A. Johnson, Tacoma, 1st Vice-Pres.; Dr. S. S. Howe, Bellingham, 2nd Vice-Pres.; M. J. Morris, Seattle, Secty-Treas.

Dr. Walter Hoffman suggested that the Secretary get in touch with the Portland Society and bring out some man from the East this summer for postgraduate work. There being no further business the meeting adjourned at 8:45 p. m.

MONTANA

FERGUS COUNTY MEDICAL SOCIETY

Pres., A. C. Biddle; Secty., E. A. Weldon

Fergus County Medical Society held its meeting at Lewistown, January 5.

Professor G. C. Manning, superintendent of city schools, discussed the epidemic of mumps and the control of contagious diseases in the schools.

The following officers were elected for the ensuing year: President, Dr. E. M. Gans, Judith Gap; vice-president, Dr. C. C. Wallin, Lewistown; secretary, Dr. E. A. Weldon, Lewistown; Drs. A. C. Biddle and J. G. Parsons were elected delegates to the meeting of the state medical association, with Drs. Ross and Weldon as alternates.

Bacteria in Muscular Tissues and Blood of Apparently Normal Animals. Bacteriologic examinations have been made by Allan F. Reith, Chicago (*Journal A. M. A.*, Jan. 30, 1926), of samples taken from the muscles of hams at various stages during slaughter, and also from muscles and blood of live hogs, rabbits and guinea-pigs. The samples were taken from them within one hour after killing. Cultures of the muscular tissues of slaughtered hogs show the presence of bacteria in 77 per cent of 216 samples examined; 57 per cent of the samples show the presence of anaerobes. Cultures of the muscular tissues of healthy live hogs, rabbits and guinea-pigs show the presence of bacteria in 83 per cent of 108 samples examined; 49 per cent of the samples show the presence of anaerobes.

BOOK REVIEWS

Edited by **KENELM WINSLOW, M.D.**

Modern Medicine. Its Theory And Practice In Original Contributions. By American and Foreign Authors. Edited by Sir William Osler Bart, M. D., F. R. S., late Regius Professor of Medicine in Oxford University, etc. Third Edition, Thoroughly Revised. Reedited by Thomas McCrae, M. D., Professor of Medicine in The Jefferson Medical College, etc. Assisted by Elmer H. Funk, M. D., Assistant Professor of Medicine in Jefferson Medical College, Philadelphia. Vol. 1 Bacterial Diseases, Non-Bacterial Fungus Infections, The Mycoses. Illustrated. 845 pp., $9.00 Lea & Febiger, Philadelphia and New York, 1925.

It is now twelve years since the first volume of the second edition of this splendid and standard system of medicine appeared. Some of the original contributors have died, including Sir William Osler, John H. Musser, James Carroll, W. P. Bunbar, Isadore Dyer, John H. McCollum M. Herzog, A. O. J. Kelly, John McCrae and E. E. Southard. In Cushing's life of Osler one reads that the latter was much disturbed by the name of Modern Medicine and not at first in favor of it. Probably because such a work should include not only the new, or modern, but the basic, eternal principles. However this may be, Modern Medicine has survived its title, and much longer than such works usually do, and is born anew, notwithstanding four recent publications of much the same character and arranged for permanency by the loose-leaf method of changing old leaves for new, reminiscent of Alladin's lamp.

Norris and Farley, writing of the treatment of lobar pneumonia, find that the newer methods of treatment by serum for type I, and by antibody solutions, are still of doubtful value. They favor the use of vaccines for prophylaxis in camps and in epidemics. Diathermy they do not deign to notice. The reviewer has seen some apparently remarkable curative effects from the pneumonia antigen of Rosenow. Funk has added to the classical article on scarlet fever by McCollom the consideration of the Dick test, active and passive immunization, and treatment by antitoxin.

There must of necessity be lack of uniformity in the general excellence of the contributions and that by Buzzard of London seems to be less modern and less up to the standard than any other. He writes on acute poliomyelitis and does not even refer to the use of lumbar puncture in diagnosis, the most valuable of all laboratory methods, and the only one we have, except Rosenow's precipitin test. Moreover, in differential diagnosis, he makes no mention of the disease with which poliomyelitis is most apt to be confused in adults, i. e., epidemic encephalitis. It is stated that "any difficulty in diagnosis is only a serious one in the acute stage and in young infants." But it is in the acute stage that diagnosis is essential for any successful treatment. And then Buzzard goes on to say that he is "unacquainted with any method of combating the acute attack." This is evident because he does not recognize lumbar puncture or the use of Rosenow's serum. Rarely

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lumbar puncture has a remarkable therapeutic effect in both acute poliomyelitis and encephalitis. In a patient with acute encephalitis, from whose blood a pure culture of specific streptococci was obtained by Dr. D. H. Nickson, there was immediate and permanent recovery following spinal puncture.

The prominent symptoms in acute poliomyelitis of fever, stiffness of the neck and back, and headache are not brought out, and the omission of lumbar puncture as a mode of diagnosis is inexcusable. Lord, in his admirable monograph on influenza, finds no evidence that the Pfeiffer bacillus is the etiologic factor, although of importance as a secondary invader. It is found in acute respiratory infections as often in nonepidemic periods as during epidemics. Francis G. Blake presents an excellent discussion of toxemia, septicemia and pyemia. He does not find any of the newer dyes or chemicals have valuable bactericidal effects. Baldwin, in a splendid paper on tuberculosis, advocates the use of tuberculin for at least four months in all afebrile patients with phthisis who are well nourished. He affirms there is no evidence that natural or artificial heliotherapy is of benefit in uncomplicated pulmonary tuberculosis. The profession is so familiar with this medical publication that it is unnecessary to say more than that it is as worthy in all respects as when it first appeared with the endorsement of the world's leading physician.

Winslow.

Thoracic Surgery. The Surgical Treatment of Thoracic Disease. By Howard Lilienthal, M. D., Professor of Clinical Surgery at Cornell University Medical School. Two Octavo volumes totaling 1294 pages, with 90 illustrations, 10 in colors. Philadelphia and London: W. B. Saunders Company, 1025. Cloth $20.00.

These two volumes from America's foremost surgeon in the sphere of thoracic surgery are a notable addition to our knowledge in this fascinating and rapidly developing field. They deal fully with all phases of surgery of the thorax and include certain specialties, related thereto to provide the necessary collateral information. The author's personal experience gives the work its real worth.

The second volume concerns itself in the main with surgical diseases of the lung and pulmonary tuberculosis. There is a complete and exhaustive chapter on the treatment of pulmonary tuberculosis by induced pneumothorax. Not to crowd out the established aids in treatment, because of the enthusiasm in the application of new adjuncts, is the sign of a valuable book. In selected types of advanced pulmonary tuberculosis not helped by other methods, fully two-thirds are benefited or cured by surgical treatment, exclusive of induced pneumothorax. Apicolysis, thoracoplasty and phrenectomy are well covered. In the chapter on cervical sympathectomy and its application to thoracic diseases the author has well illustrated the steps and appended instructive case histories. This work will prove invaluable to one performing this class of surgery.

Forbes.

Lectures on Heredity. A series of lectures given at the Mayo Foundation and the Universities of Wisconsin, Minnesota, Nebraska, Iowa and Washington (St. Louis) 1923-24. 12 mo. 250 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1925. Cloth, $2.50 net.

This volume discusses various phases of heredity through lectures delivered by professors in various universities. They deal with the general problem of heredity, heredity of sex, heredity of acquired characters, heredity in relation to cancer. the influence of heredity on the occurence of cancer and eugenics. The chapters on heredity and cancer, by Slye and Wells, make an especial appeal to medical men. The former's experiments with mice, and the latter's application of the same to conditions in man present a fascinating description both suggestive and convincing. It would be well worth-while for anyone to read this volume and thereby elaborate his conception of the subject of heredity.

Proceedings of the International Conference on Health Problems in Tropical America. Held at Kingston, Jamaica, B. W. I., July 22-August 1, 1924. By invitation of the Medical Department, United Fruit Company. Published by United Fruit Company, Boston, Mass., 1924.

The conference reported in this publication was convened for the purpose of considering sanitary and administrative questions, to discuss tropical diseases, to standardize practice and to promote preventive medicine and hygiene in tropical lands. The authors of papers herein presented are among the most distinguished authors on tropical diseases in the United States, Central and South America and Europe. Many conditions discussed will rarely if ever come under the observation of physicians in the Northwest, including malaria, yellow fever, pellagra, hookworm and other tropical diseases. There are, however, several contributions on the subject of amebiasis, tuberculosis, cancer and other diseased conditions familiar to all practitioners. This is a collection of scientific papers of the highest value which are well worth reading and study.

The Surgical Clinics of North America. (Issued serially, one number every other month.) Volume V, Number 5. (St. Louis Number—October, 1925.) 246 pages with 54 illustrations. Per clinic year (February, 1925, to December, 1925.) Paper $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

This volume presents instructive discussions of numerous surgical problems. Among the most striking is the clinic by Sachs on surgical treatment of lesions of the central nervous system. He cites four cases of brain and cord lesions relieved by surgical intervention. Abbott's treatment of congenital clubfoot describes a series of cases, in which he specially stresses the importance of manipulation, particularly if applied in the early years of childhood. Osteomyelitis is considered by Clopton, while the treatment of osteomyelitis of the jaws is detailed by Blair and Brown. Many other instructive discussions are presented.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho, Montana and Pacific Northwest Medical Association

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ORIGINAL CONTRIBUTIONS

THE CONTROL OF SCARLET FEVER*

George F. Dick, M.D.
and
Gladys Henry Dick, M.D.
CHICAGO, ILL.

Descriptions of acute diseases accompanied by rashes are found in the earliest medical writings. Some of these descriptions correspond closely to the clinical picture of scarlet fever. For several centuries the various exanthemata were confused. The pustular lesions of smallpox soon established the identity of this disease, while the confusion between the rashes of scarlet fever and measles continued until the latter part of the seventeenth century.

In 1675, Sydenham clearly differentiated scarlet fever from measles and wrote a complete description of the former, to which he gave the name "febris scarlatina.".

After scarlet fever was established as an entity, the differential clinical types were recognized and the frequency of complications and sequelæ was noted. By the end of the eighteenth century clinical knowledge of scarlet fever was well developed. At this time Jenner's discovery of a safe method of inoculating against smallpox stimulated those who were interested in scarlet fever to attempt vaccination against this disease in the hope of producing a mild form that would protect against more severe attacks.

Every conceivable method of vaccination was employed. In 1806, Becker,[1] a German physician, published a book, in which he described the various methods of inoculation then in use, most of which had originated in England. He especially recommended obtaining blood from a cut in the skin of a scarlet fever patient and rubbing it into scarifications on the arms of persons who had not had the disease. Another method consisted of collecting skin scales from desquamating cases, pulverizing them, and rubbing the resulting powder in superficial cuts. One English doctor advised inoculating by means of a linen thread, moistened in the tears or saliva of a scarlet fever patient. Another employed material from the ulcerative lesions in the throat.

In 1862, Hudson,[2] an Ohio doctor, reported that, during an epidemic of smallpox in his village, he was called to see a man who had been exposed to smallpox and thought he had it. Dr. Hudson was asked to vaccinate the whole family which he did. The next day it was apparent that, instead of smallpox, the man had an attack of scarlet fever. At that time vaccine material was scarce, and Dr. Hudson asked that the scabs from the arms of two little boys in the family be saved. In about three weeks he received an envelope containing the two scabs which he immediately used to vaccinate about thirty children. Within five to six days twenty-three of these children had developed a mild form of scarlet fever. They all did well, recovering without any complications. It was found that the two boys whose scabs were used had had attacks of scarlet fever so mild that no physician was called.

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* Annual Lecture, delivered before Portland Academy of Medicine, Portland, Ore., Jan. 14-15, 1926.

Dr. Hudson was severely criticised, but he felt that, since all the cases were mild, he had accidentally discovered a safe method of inoculating against the disease. He suggested that epidemics of scarlet fever might be controlled by vaccinating scarlet fever patients against smallpox in the first days of illness, obtaining the scabs, and employing them for inoculations against scarlet fever.

None of these various methods of inoculating against scarlet fever proved successful. They could not be depended on to be effective, and in case the inoculation was successful, the type of disease produced was not always mild. Consequently such attempts at preventive vaccination were abandoned.

In the latter part of the nineteenth century, the rapid development of the science of bacteriology furnished fresh hope to those seeking a way to control scarlet fever. About two hundred years after the disease was differentiated clinically, scientists turned their attention to a study of the bacteria associated with scarlet fever in an endeavor to find the causative organism.

Among the first diseases studied by bacteriologic methods was erysipelas and puerperal sepsis. Cocci occurring singly, in pairs, and in chains were found in erysipelas in 1869. They were reported by several other observers between that year and 1881, when Fehleisen established the bacterial nature of erysipelas.

While the work on erysipelas was progressing, similar investigations were being made into the cause of puerperal sepsis. In 1872, Coze and Feltz[3] had demonstrated the pathogenicity for rabbits of streptococci obtained from the blood in puerperal sepsis. Pasteur[4] found that, while postpartum infections were frequently due to streptococci, other organisms might be concerned. He emphasized the wide distribution of streptococci in nature. He stated that the streptococcus could not be properly termed the specific cause of puerperal sepsis.

After they were demonstrated in erysipelas and puerperal sepsis, streptococci were found in a number of other conditions. For the most part, these organisms were given names which indicated their source, morphology, or cultural characteristics, such as streptococcus septopyemicus, streptococcus nasalis, streptococcus coli brevis, streptococcus lanceolatus and Rosenbach's streptococcus pyogenes.

Within a few years, more than sixty, supposedly different kinds, of streptococci had been described under as many different names.

Streptococci had been found in the blood of scarlet fever patients by Hallier,[5] whose results were confirmed by Coze and Feltz.[6] They were demonstrated in the throat, organs and skin scales, and in various complications by a number of observers, including Klebs, Pincus,[7] Loeffler,[8] Fraenkel,[9] Freudenberg,[10] and Babes.[11]

In 1886, Power[11] described an epidemic of scarlet fever, in which the disease appeared among families supplied with milk from the Hendon farm. The epidemic was coincident with the appearance of a contagious disease in the cows. Among other symptoms, the cows showed vesicles on the udder. In 1887, Klein reported that he had found streptococci in the udder lesions, and attributed the epidemic of scarlet fever to streptococcus contamination of the milk. He regarded the infection of the cows as a modified form of scarlet fever. It was later shown, by means of vaccination experiments, that the disease in cows was not a bovine form of scarlet fever but cow pox; and that persons infected by milking diseased cows did not acquire scarlet fever, but developed vaccinia on their hands.

In 1893, Dowson[12] emphasized the probability that the tonsils are the common portal of entry for the scarlet fever germ, and advanced the theory that the so-called scarlet fever "virus" might be a microbic poison secreted in the diseased tonsils. In 1895, Berge[13] published a thesis, in which he concluded from clinical observation alone that scarlet fever is due to a toxin produced in the throat by the streptococcus. While Berge's thesis was a more or less philosophical discussion based on clinical observations, and he offered no proof of his theory, it shows us that by the end of the last century clinicians had recognized the toxic element of scarlet fever, to which they frequently referred subsequently as the toxemia or the "unknown poison" of the disease.

It was not until the beginning of this century that Schottmueller's work enabled bacteriologists to differentiate hemolyzing streptococci from those which produce green in blood. There was no way of knowing to which type the organisms previously described belonged. However, it was soon learned that it is the hemolytic type which predominates in erysipelas, puerperal sepsis, pyogenic infections, and scarlet fever.

On account of its association with the disease, some workers regarded the hemolytic streptococcus as the cause of scarlet fever; but they did not succeed in demonstrating its etiologic relation. And the presence of hemolytic streptococci in other pathologic conditions threw considerable doubt on its etiologic significance in scarlet fever. Most scientists looked upon the hemolytic streptococcus as an important secondary invader, believing that the primary infection was due to some unknown organism.

When we began the study of scarlet fever in 1912, it was still considered a disease of unknown etiology. None of Koch's requirements had been met. Various bacteria had been described from time to time as the cause of scarlet fever, but their constant presence in the disease had not been verified, except in the case of the hemolytic streptococcus. Hemolytic streptococci of one kind or another were known to be almost constantly associated with scarlet fever. It had not been shown that any one type was characteristic of the disease.

There were no morphologic, cultural or immunologic characteristics, by which the streptococci of scarlet fever could be differentiated from streptococci found in other pathologic processes. Without this and without the production of experimental scarlet fever, it was not possible to determine whether streptococci were causal organisms or secondary invaders.

Experimental scarlet fever had not been obtained. Atypical rashes, or fever and leukocytosis had been described in animals, following inoculations with various materials of scarlet fever origin, but even these symptoms had been inconstant. No one had obtained symptoms sufficiently typical to justify the designation of experimental scarlet fever.

Accidental inoculations of human beings had occurred under conditions that did not justify any conclusion as to the etiology of the disease. Such an incident was reported by Nicoll and Krumwiede, when an assistant developed scarlet fever following accidental sucking of a bacterial suspension into the mouth through a pipette. This bacterial suspension contained twenty-two strains of organisms from five different diseases, and green-producing as well as hemolytic streptococci. The presence of a filterable virus was not excluded. Consequently the incident threw no light on the etiology of scarlet fever. The idea was prevalent that a filterable virus was responsible for the disease, but this was based on negative rather than on positive findings.

Since the earlier work on the bacteriology of scarlet fever, new cultural methods had been developed. In beginning our study, we first went over the bacteriology of the disease, employing these newer methods. Bacteriologic examinations were made of the throat, blood, urine, feces and skin scales of scarlet fever patients, and of organs obtained postmortem. Aerobic and anaerobic cultures were made in a variety of mediums.

In these cultures we found a number of bacteria commonly associated with scarlet fever, but organism occurred more frequently than the hemolytic streptococcus. A comparison of the bacteriology of the throat, blood and urine indicated that during the acute angina occasional organisms, few in number, find their way into the blood stream and may be excreted through the kidneys. No organism was found in the blood in early, uncomplicated cases in large numbers or frequently enough to indicate a causal relation to scarlet fever.

The various bacteria isolated were inoculated into guinea pigs, rabbits, dogs, mice, pigeons and small white pigs. The inoculations were made in the throat subcutaneously, intraperitoneally and intravenously. In this series of animal experiments, reported in 1914,[14] an occasional rash was obtained, and less frequently desquamation. But these symptoms followed inoculations with a variety of organisms, and no one organism produced constantly in any species a condition that could be accepted as experimental scarlet fever.

Since scarlet fever is a disease characterized by the production of a high degree of immunity, we thought that a study of the immune reactions of the bacteria most commonly associated with the disease might give some information as to which organisms took part in the infection, either as primary or secondary invaders. Suspensions of the different organisms were tested for agglutination and for complement fixation with specimens of blood serum from convalescent scarlet fever patients. Cutaneous tests were also made with suspensions of heat-killed bacteria. The results of these tests were reported in 1916.[15] They indicated that, while agglutination and complement fixation may be demonstrated with a variety of bacteria, associated with scarlet fever, the hemolytic streptococcus is the only organism that produces immune bodies with any degree of constancy during the course of the disease.

We thus verified the results of previous investigators as to the association of hemolytic streptococci with scarlet fever, and the production of immune bodies. But the association of an organism with a disease, and even the production of immune bodies to it, does not constitute proof of its etiologic significance. It might be present as a secondary invader, and as such it might stimulate the formation of antibodies.

The production of experimental scarlet fever remained the essential step in the determination of the etiology of the disease. In order to learn whether it is possible to obtain an acceptable form of experimental scarlet fever in laboratory animals, they were inoculated subcutaneously, intraperitoneally and intravenously, as well as in the throat with fresh blood serum, blood plasma, whole blood, throat mucus, and urinary sediment from early cases of scarlet fever, and with macerated skin scales from desquamating cases. They were also inoculated with ground tonsils, lymph glands and spleens obtained as soon as possible after death. It was reasonable to believe that in some of the inoculations each species of animal used had received material containing the specific organisms of scarlet fever. The negative results of these experiments led us to conclude that laboratory animals are comparatively insusceptible and that it would be necessary to use human volunteers for the production of experimental scarlet fever.

Many attempts had been made to produce experimental scarlet fever in man. Inoculations had been made with material from erythematous areas, serum from vesicles, skin scales and blood from scarlet fever patients without success. Even with human volunteers we could not expect to obtain experimental scarlet fever readily, for it was known that less than half of the persons exposed contract the disease.

Before undertaking the human experiments, we attempted to learn by means of immune reaction where in the body of the scarlet fever patient the specific organism exists in greatest abundance. The antigenic properties of the blood serum were compared with the antigenic properties of the throat secretions by means of complement fixation tests with the serum of convalescent patients. These tests showed no evidence of any specific virus or antigen in the blood serum. And similar tests failed to show any antigen in the spleen or lymph glands. In one instance there was a weak complement fixation with antigen prepared from scarlatinal throat mucus.

On the supposition that the antigenic property of the throat mucus might be due to a specific virus or antigen, a more detailed study of the bacteriology of the throat was indicated. But before going further with the complicated bacteriology of the throat, we attempted to learn by human inoculation experiments whether the specific organism is present in the blood in some form unrecognized by the cultural methods or immune reactions employed.

Healthy young adults who said that they had not had scarlet fever were selected. The first volunteers were inoculated with blood serum freshly obtained from early, uncomplicated cases of scarlet fever. The serum was swabbed on the tonsils of each volunteer and daily observations were made for sore throat, fever, and a rash on the skin or on the palate. The results of these experiments were negative. The next volunteers were inoculated subcutaneously with blood serum in amounts ranging from 0.5 to 5 c.c. These injections were not followed by any local reactions or by any symptoms of scarlet fever. Another group of volunteers were inoculated subcutaneously with whole blood from patients with acute scarlet fever. The blood was withdrawn from the patients' veins and injected into volunteers while it was still warm. The results of these experiments were also negative.

In all, fifteen volunteers were inoculated with blood serum or whole blood. These experiments tended to confirm our conclusion, based on bacteriologic examinations and immune reactions, that the specific organism is not usually present in the blood stream during the early stage of uncomplicated scarlet fever.

The immune reactions had given some indication of the presence of a specific organism in the throat, and a more exhaustive study of the bacteriology of the throat was now undertaken. We first attempted to learn whether or not scarlet fever is caused by a filterable virus. Throat secretions, obtained early in the disease, were shaken in a small amount of broth and the suspension filtered. Volunteers were inoculated in the throat with the filtered material. These volunteers remained well. Following this, scarlet fever patients were given broth to gargle, and after filtering the broth was inoculated subcutaneously in another series of volunteers. None of the volunteers in this series developed scarlet fever. Some showed, at the site of inoculation, a slight local redness that disappeared at the end of forty-eight hours. These local reactions correspond to the skin test described later, and indicate that some of the volunteers, who did not acquire scarlet fever on subcutaneous inoculation of filtered throat mucus, were actually susceptible to the disease.

These experiments had failed to demonstrate any filterable virus in the throat in scarlet fever, and we began inoculation of volunteers with pure cultures of bacteria most commonly found in the throat secretions. Since the hemolytic streptococcus is the organism mostly commonly present in scarlet fever, and the one to which immune bodies are most frequently produced, the next volunteers were inoculated with pure cultures of hemolytic streptococci isolated from early cases. Thirty volunteers were used. The inoculations were made by swabbing twenty-four to forty-eight hour cultures of the organisms on the tonsils and pharynx. In this series no experimental scarlet fever was obtained. Most of the volunteers remained well. They did not complain of sore throat, and daily examinations of the throat revealed no signs of inflammation. There were, however, a few who developed sore throat, accompanied by fever and leukocytosis, and a transient enlargement of the cervical lymph glands, without any rash on the skin or palate.

Volunteers were also inoculated with some of the other organisms frequently present in scarlet fever. The results of these inoculations were negative.

We thought that failure to obtain the rash in the experimental inoculations with hemolytic streptococci, in the volunteers who did develop a sore throat and fever, might be due to a relative insusceptibility on the part of these volunteers. And we decided to do some further inoculation experiments, using volunteers of an intelligent type, who could give their full personal and family history, and to select them so far as possible from those who had spent their childhood in rural districts, or in homes where an ordinary attack of scarlet fever would probably have been recognized.

In this series we obtained a case of typical scarlet fever by inoculation with a pure culture of a hemolytic streptococcus, isolated from a lesion on the finger of a nurse who had acquired the disease while caring for a convalescent scarlet fever patient. This was the first case of experimental scarlet fever produced by the inoculation of a pure culture of any organism. It was reported October 6, 1923.[16]

The greatest difficulty in the determination of the etiology of scarlet fever had now been overcome, but it was still necessary to learn whether the experimental disease had been produced by the hemolytic streptococcus, or by a filterable virus associated with it in the culture. A second group of volunteers were inoculated with a culture of the same organism after it had been passed through a Berkefeld "V" filter. These volunteers remained well. After two weeks had elapsed, and they were still well, they were inoculated with the unfiltered culture. Forty-eight hours later one of them developed scarlet fever. This experiment furnished further evidence that the disease is not caused by a filterable virus, but is due to the hemolytic streptococcus itself.

There were still some difficulties. Streptococci of the same cultural type cannot be demonstrated in all cases. They may be divided into two main groups according to their effect on mannite. Experimental scarlet fever had been obtained by inoculation with a strain that fermented mannite, and in each case the organism had been recovered from the experimental disease, and again grown in pure culture. All of Koch's laws were thus fulfilled except that one which requires that the organism be constantly present in the disease. In order to meet this requirement, it was necessary to learn whether or not scarlet fever can be produced with the streptococci that do not ferment mannite.

In the series of inoculation experiments in which experimental scarlet fever had been obtained, only two of the ten volunteers had acquired the disease. These ten volunteers were all young adults who said that they had not had scarlet fever and so far as they knew they had never been directly exposed. They were all inoculated with the same culture. The failure of some to acquire the disease, while others developed it in a typical form was attributed to a difference in susceptibility. We wished, if possible, to find some means of determining susceptibility to scarlet fever in order to select volunteers for our next experiments. We had previously made attempts to demonstrate immunity by means of skin tests. In 1916, we described the reaction following intracutaneous injections of killed streptococci. These reactions had shown nothing specific.

Since hemolytic streptococci are found in the throats of scarlet fever patients and are seldom present in the blood stream of uncomplicated cases, it is evident that the rash is not produced by the direct action of the hemolytic streptococcus on the skin. This suggested that the hemolytic streptococcus growing in the throat produces some substance which in turn is responsible for the rash. If we could find this substance, it might be possible to use it in skin tests to determine the susceptibility of our next volunteers.

The Berkefeld "V" filtrate that had failed to produce experimental scarlet fever in the previous experiments was now used for cutaneous tests. Intradermal injections of this filtrate were followed by local inflammatory reactions more frequently in persons who had no history of scarlet fever than in patients convalescent from the disease. It was found that, when the filtrate was used in the proper dilution, it gave negative or only slightly positive reactions in persons convalescent from scarlet fever, and positive reactions in a certain number of persons who gave no history of scarlet fever.

Volunteers for the next experiment were selected by means of skin tests made with this filtrate. Two were chosen, one with a negative and one with a positive skin test. A hemolytic streptococcus that did not ferment mannite was isolated from the throat of a scarlet fever patient. Part of a forty-eight hour culture of this organism was swabbed on the tonsils and pharynx of each volunteer. The volunteer who had shown a negative skin test remained well, while the volunteer with a positive skin test developed scarlet fever.

The hemolytic streptococci used in these experiments had now fulfilled all the requirements of Koch's laws, and the conclusion that they are the cause of scarlet fever was justified. Filtrates from cultures of the streptococcus, used in the last experiment, produced cutaneous reactions similar to those obtained with filtrates from the mannite fermenting strain.

The results obtained thus far indicated that the reactions following intradermal injections of the filtrates furnished a means of determining immunity to scarlet fever. That the negative results in convalescent scarlet fever were not due to an inability of the skin to react was shown by the fact that a number of the patients had positive Schick tests at the same time that the test with the streptococcus filtrate was negative on the other arm. That the positive reactions in the persons who had not had scarlet fever were not due to foreign protein in the culture medium was shown by negative results on intradermal injections of the sterile, undiluted culture medium.

Further evidence of the specific relation of this test to scarlet fever was afforded by the following experiments. Mixtures of equal volumes of the filtrates with convalescent scarlet fever serums were incubated for thirty minutes. Control mixtures of salt solution and filtrate were also incubated. Skin tests were made with both mixtures in persons who had previously shown positive reactions. At the end of twenty-four hours the tests with the serum mixtures were negative, while those in which salt solution had been mixed with the filtrate were positive. These results indicated that the blood of convalescent scarlet fever patients contains a substance capable of inhibiting the action of the filtrate on the skin.

Persons with positive skin tests were then given convalescent scarlet fever serum by intramuscular injections. Skin tests made after this passive immunization were negative.

When some of the persons with positive skin tests received injections of larger amounts of the filtrate, they developed general malaise, nausea, vomiting, fever and a generalized scarlatinal rash. Following this reaction, the skin test was modified or negative. The blood serum of these persons was found to have acquired the property of neutralizing the action of the filtrate, similar to the neutralizing power of convalescent scarlet fever serum.

The negative reactions in convalescent scarlet fever patients, the neutralization of the filtrate by convalescent serum, and the scarlatinal rashes, accompanied by other symptoms characteristic of scarlet fever, following injection of small amounts of the sterile filtrate, indicated that we were dealing with a substance specific for scarlet fever.

The short interval between the injection of the filtrate and the beginning of the reaction compared with the incubation period of about forty-eight hours in experimental scarlet fever; and the more rapid disappearance of the symptoms indicated that the symptoms were produced by a soluble toxic substance rather than a living virus.

Neutralization of the toxic substance by the blood serum of persons immunized by subcutaneous injections of the filtrate indicated that the substance is a true toxin, capable of forming an antitoxin.

The discovery of this specific toxin offered a scientific foundation for first, the recognition of scarlet fever streptococci; second, the development of a skin test for susceptibility; third, preventive immunization, and fourth, the production of an antitoxin.

RECOGNITION OF SCARLET FEVER STREPTOCOCCI

The two strains of streptococci that caused experimental scarlet fever differed culturally and were not agglutinated by the same immune serum, but they had in common the property of producing the specific toxin.

Up to this time there has been no satisfactory method of identifying scarlet fever streptococci. Morphologically the streptococci of scarlet fever are not distinguishable from streptococci of other sources. They have no characteristic staining reactions, and the appearance of the colonies on blood agar plates is too variable to furnish a means of differentiation. Streptococci of the same cultural type cannot be demonstrated in all cases of scarlet fever, and the two strains which produce the disease experimentally in man differed in their effect on mannite.

Since the recognition of the specificity of the agglutination test and its application to the diagnosis of typhoid fever, many observations have been made on the agglutination of streptococci in relation to scarlet fever. The first reports were made by Moser and Pirquet in 1902,[17] and by Rossiwall and Schick in 1905.[18] This earlier work was done with Moser's serum, obtained by immunizing horses with living streptococci isolated from fatal cases of scarlet fever. It was found that many but not all of the streptococci associated with scarlet fever were agglutinated by Moser's serum.

In 1906, Ruediger[19] reported agglutination tests with the serum of a sheep immunized by intravenous injections of streptococci of scarlet fever origin. He found that this serum agglutinated most of the streptococci associated with scarlet fever.

In 1920, Tunnicliff,[20] and Dochez and Bliss[21] concluded that the hemolytic streptococci found in scarlet fever may be distinguished from others by means of the agglutination test. Dochez later reported that he obtained agglutination in only 75 to 80 per cent of scarlet fever cases. These last figures are more in accord with our experience and with the results reported by the earlier observers mentioned. They indicate that the agglutination test is not a reliable method of identifying scarlet fever streptococci. No serum agglutinates specifically streptococci from all cases of scarlet fever. Certain strains cannot be tested because of spontaneous agglutination, and agglutination of streptococci from other sources is not uncommon.

A study of the toxin production of hemolytic streptococci offers a more hopeful means of identifying the organisms which are capable of producing scarlet fever in susceptible persons. This is accomplished by means of skin tests with sterile filtrates of broth cultures of the organism in question. If a toxin is found, it must be shown that it is neutralized by convalescent scarlet fever serum, or better still by an antitoxin obtained by immunizing animals with the filtrates of the streptococci that produced experimental scarlet fever in man.

Since the publication of this method, considerable work has been done on the toxin production by hemolytic streptococci isolated from other diseases. Birkhaug and Singer state that the toxin produced by the erysipelas streptococcus is distinct from the toxin of scarlet fever. The whole subject of toxin production by hemolytic streptococci is new, and further investigations are necessary to determine the distribution of scarlet fever streptococci.

For some years there has been discussion as to whether scarlet fever convalescents with discharging, suppurative lesions should be quarantined till all discharges are stopped; or whether these lesions should be regarded as due to secondary invaders, and the patients released at the end of the usual period of quarantine. Since hemolytic streptococci are usually present in the discharges, and scarlet fever is now known to be caused by hemolytic streptococci, the question narrows to a determination as to whether the organisms present in the suppurative lesions are the primary invaders or some different, nonspecific type of streptococcus. This may be decided by testing them for specific toxin production. In uncomplicated cases of scarlet fever the hemolytic streptococci usually disappear from the throat and nose during convalescence, but that persons who have had scarlet fever may harbor the specific streptococcus after apparent recovery is shown by the fact that organisms which produce scarlet fever toxin have been found in discharges from sinuses, glands, and middle ears after the patients have been released from quarantine. We have also found scarlet fever streptococci in throat cultures of immune contacts.

Dilute solutions of scarlet fever toxin are employed in skin tests to determine susceptibility to scarlet fever. Toxin for this purpose is made by inoculating plain broth with scarlet fever streptococci. If one-tenth to one-fourth per cent sheep or human blood is added, a stronger toxin is obtained. The broth cultures are incubated several days, then passed through Berkefeld filters to remove the bacteria. The filtrate is cultured to determine its sterility, and kept in the refrigerator. A preventive may be added before or after filtration. After standing about six weeks in the refrigerator, the toxin is ready for standardization. Most batches of toxin lose strength rapidly during the first weeks, then become stable.

The successful use of scarlet fever toxin in skin tests and preventive immunization depends on first, specificity; second, low foreign protein content; and third, accurate standardization.

To ensure specificity, it is necessary to employ strains of hemolytic streptococci which have been previously tested and are known to produce the specific toxin of scarlet fever. If the toxin is prepared from medium containing a minimum amount of foreign protein, and no material is used which is not sufficiently strong to require dilution of at least one to one thousand for the skin test, pseudoreactions are practically eliminated. Increase in the protein content of the medium, addition of an excess of blood, or use of horse blood result in products which may give both specific and nonspecific reactions. The reactions which are not specific for scarlet fever are particularly troublesome after active immunization with the toxin. We have had samples of toxin sent to us for testing which gave in some instances considerably stronger skin tests after immunization than before, while the skin test with properly prepared toxin had become negative.

The skin test dose of toxin should be the amount which, injected intradermally, gives reactions that indicate whether or not the individual has sufficient immunity to prevent the development of scarlet fever, in case he should be exposed to the disease and become infected. This skin test dose lies within narrow limits, and requires careful standardization for its determination. At present, the only reliable method of standardizing the toxin is by means of skin tests on human beings. Attempts have been made to standardize the toxin on animals. But, on account of the comparative insusceptibility of laboratory animals to scarlet fever, it is not practical to transfer the results obtained in animals to human beings.

There is every possible degree of immunity to scarlet fever. The highly immune person may show a negative reaction with one hundred and fifty times the skin test dose of toxin, while the highly susceptible person may react to a fraction of the skin test dose. To determine the degree of immunity that affords protection from the disease and arrive at the proper skin test dose required about one year. Tests were first made with various dilutions of toxin in a series of convalescent scarlet fever patients. The largest amount of toxin that gave negative, or only slightly positive, reactions in immune persons wer ethus determined. A series of persons who gave no history of scarlet fever were then tested with higher dilutions to find the smallest amount of toxin that gave positive reactions in susceptible persons. The proper skin test lay somewhere between the maximum and minimum thus determined.

Skin tests with various dilutions within this range were made on persons who had recently been exposed to scarlet fever or were about to be exposed. Complete objective descriptions of the reactions with the various dilutions were recorded, and the persons tested were observed closely during the time of their exposure. Some in this series contracted scarlet fever and we were thus enabled to determine the dose of toxin which gave skin tests indicative of susceptibility to scarlet fever.

A positive reaction may be produced in immune persons by injecting a larger skin test dose. And negative reactions may be obtained in susceptible persons by reducing the dose.

Some skins react to the intradermal injection of sterile salt solution with a papule formation. In order to exclude the papules, and make it possible to add preservative to the skin test solution without the small reddened areas caused by the preservative being interpreted as positive reactions, the skin test dose was so arranged that an area of reddening less than one centimeter in all diameters is regarded as a negative reaction. An area of reddening one centimeter or over in any diameter, no matter how faint the color may be, constitutes a positive reaction, and indicates some degree of susceptibility to scarlet fever.

The toxin of scarlet fever causes less inflammation in the skin test than the diphtheria toxin employed in the Schick test. Physicians who are familiar with the Schick test frequently interpret positive reactions with scarlet fever toxin as negative.

The induration characteristic of the positive Schick test is unusual in skin tests for susceptibility to scarlet fever. Swelling is associated with only the more strongly positive reactions. It is a superficial inflammatory edema of the skin, rather than a subcutaneous induration.

Reactions to scarlet fever toxin are transient. It is necessary to observe them not later than twenty-four hours after the tests are made. In partially immune persons the reaction frequently begins to fade soon after it appears. At the end of twenty-four hours it may show a faint, dull red, brownish, or slate blue color. If it is entirely faded at the end of twenty-four hours, the test is negative. Positive reactions frequently disappear within thirty-six hours.

Reactions that are not modified by an early fading may vary from a faint pink flush to an intense, bright red. Some are of a rash type, composed of red points on a white background. The more intensely red reactions may be surrounded by a zone of pallor. Sometimes the lymphatics in the immediate vicinity of the skin test are outlined by faint pink streaks. Occasionally there is a rash in the bend of the elbow above the test.

Of the persons tested in Chicago we found forty to sixty per cent susceptible, depending on the age and the environment of the different groups. We have observed a series of two hundred nurses who showed negative skin reactions before the they undertook the care of scarlet fever patients. These nurses, with negative skin tests, were not protected by either active or passive immunization, and they were exposed to the disease for periods of six weeks to one and a half years. None contracted scarlet fever.

No case of scarlet fever developed in four hundred and seventy persons with negative skin tests who had direct, but less prolonged exposure. Throat and nose cultures, made after exposure, showed hemolytic streptococci in ninety-three of the four hundred and seventy exposed persons. That none of these persons with hemolytic streptococci developed scarlet fever must be attributed to their immunity as demonstrated by the skin test; for strains of hemolytic streptococci, isolated from some of them, produced the specific toxin of scarlet fever.

In four persons with slightly positive skin reactions, exposure to scarlet fever was followed by sore throat of two or three days duration. Skin tests made after the sore throat had subsided were entirely negative. In none of these cases was any rash seen, but two of the four desquamated. The other two did not desquamate, although the organisms isolated from one produced an exceptionally strong scarlet fever toxin. Such atypical symptoms of scarlet fever are particularly apt to follow exposure to scarlet fever in persons with only slightly positive skin tests, or in those who have been incompletely immunized.

Eight persons with positive skin tests and many hemolytic streptococci in their throat cultures taken after exposure, who were temporarily protected by a prophylactic dose of scarlet fever antitoxin, contracted scarlet fever on another exposure at intervals of one to eleven months after the antitoxin had been given. Scarlet fever developed in nine persons who had positive skin reactions and hemolytic streptococci in their throat cultures, but did not receive any prophylactic treatment.

Four patients, three sick with acute tonsillitis, the other with ethmoidal sinusitis, had positive skin tests and many hemolytic streptococci in their nose and throat cultures. They had not been exposed to scarlet fever and did not develop the disease, nor did the skin reaction become negative during the course of the infection in any case. The hemolytic streptococci isolated from two of these patients did not produce a demonstrable toxin.

Eleven persons with positive skin reactions but not infected at the time the tests were made, developed scarlet fever, following exposure from one week to a year later. Six persons with positive tests, who were being immunized, were exposed to scarlet fever, and developed a mild form of the disease before their immunization was completed. Such results indicate that skin tests made with specific toxin, properly prepared and accurately standardized, furnish a reliable means of determining susceptibility to scarlet fever.

(To be concluded)

PROTEST THE SHEPPARD-TOWNER ACT. The Sheppard-Towner Act will continue in force two additional years—until June 30, 1929—if two bills introduced into Congress to accomplish that end are permitted to become law. Otherwise, the act will expire by a self-contained limitation, June 30, 1927. The proposed continuance of federal domination over health matters in which the state is constitutionally supreme is in itself pernicious. The proposal is, moreover, astutely timed to force on Congress at the very threshold of the next presidential campaign the question of making the system permanent. It will be remembered that the original proposal was also incorporated as a plank in the platforms of both leading political parties. The proponents of the Sheppard-Towner scheme are apt to brush aside facts and figures by an emotional appeal on behalf of mothers and babies. Any discussion of the scheme in the days immediately preceding a presidential campaign is certain to be complicated further by considerations of political expediency, arising out of the question as to who is going to deliver the women's vote, and where. The act became a law five years ago. Millions of dollars of federal and state moneys have been spent to enable its supporters to establish its merits. Who will say the evidence submitted indicates that they have done so? Their present plea for the continuance of the scheme for only two years may well be construed as an admission that they have found nothing in the evidence that would justify them in asking for enactment of the procedure on a more lasting basis. The Sheppard-Towner Act has been condemned unreservedly by the House of Delegates of the American Medical Association. The pending bills to continue the act in effect are clearly within the ban of such condemnation. Now is the time to protest against their enactment. The Committee on Interstate and Foreign Commerce, House of Representatives, to which the House bill has been referred, at the present writing has not made its report. Even after it does so, the bill must be acted on by the House. The Senate bill is still to be acted on by the Senate Committee on Education and Labor, and by the Senate. If the Senate and the House agree on a measure, it will still have to be approved by the President. State associations and county societies, and the physicians of the country generally, should immediately telegraph or write to the President and to their Senators and Representatives protesting against the enactment of these bills.—*Jour. A. M. A.*, Feb. 6, 1926.

BLOOD PRESSURE IN WOMEN AS INFLUENCED BY POOR PELVIC ORGANS*

WALTER C. ALVAREZ, M.D.
SAN FRANCISCO, CALIF.
From the George Williams Hooper Foundation for Medical Research
University of California Medical School

Anyone who will take the time to review the recent literature on human blood pressure will probably be struck by the marked influence of sex upon it. Boys and girls start out in life with the same manometer readings, but at puberty a marked change appears. Both sexes show a definite increase, but this is so much more marked in the boys that by the age of sixteen or seventeen they are averaging 10 mm. more than the girls. Furthermore, we begin to find among the boys a good many cases of real hypertension. After the age of seventeen or eighteen the mean pressure tends to drop till the age of twenty-eight in men and twenty-four in women. After that it rises so much more rapidly in the women that after the age of forty the women average considerably higher than do the men.

Another interesting sexual difference is brought out when we study the distribution curves in men and women. After puberty, the curve for the men is low and wide, whereas that for the women remains for a few years high and narrow. That means that there is a greater variation in the pressures of men, whereas the pressures in young women are grouped around the average. We find also that there is much more hypertension among the young men than among the young women. At the University of California there were, among the men, 20.7 per cent with pressures over 140 mm. and, among the women, 2.7 per cent.

HEREDITY AND HYPERTENSION

It would seem obvious that something which appears so strikingly in college freshmen cannot be ascribed to the strenuous life; and something which is distributed so unevenly between the two sexes cannot be ascribed to focal infections, intestinal autointoxication or other conditions which we would expect to find as commonly in men as in women. It would seem more probable that we must be dealing with some bodily peculiarity which is perhaps inherited equally by both sexes but which is held back in the younger women by the ovarian hormone. Later in life, as the ovaries atrophy, the defect can be uncovered.

Since the writer made this suggestion several years ago, O'Hare, Walker and Vickers, and Weitz have made some statistical studies which leave little doubt that hypertension is hereditary. Other studies on the plumage changes in spayed pullets have been very suggestive, in that they have shown how dormant male characteristics can be uncovered by the removal of the ovaries. These pullets, after being operated upon, will develop the feathering and many of the other characteristics of a cock. It may be, therefore, that in women hypertension can emerge at the menopause or after the removal of the diseased ovaries much as hair emerges on the face, and for the same reason.

This theory would receive great support, if it could be shown that a considerable proportion of young women who are born with poor ovaries or who early in life lose them through disease or operations, develop hypertension. Naturally we would not expect all of these women to develop it because many of them lack the latent tendency. They belong to that definite group of individuals who can go into their seventies with pressures under 140 mm. of mercury.

MATERIAL USED

The present study is based on an analysis of some 1,230 records from my office. These histories were abstracted on cards, on which note was made of the name of the individual, her civil status, age, number of children, menstrual history, history of pelvic disease and operations, pelvic findings, weight and build, condition of the breasts, distribution of hair on face and body, sexual anesthesia, thyroid disease and blood pressure. These cards were then sorted into three piles, designated sexually normal, sexually abnormal one plus, and sexually abnormal double plus. While this was being done, the pressure record was covered up so as to avoid mental bias.

The typical individual classed as sexually deficient would have one or more of the following points in her history or findings: irregular, painful, scanty or very profuse menstruation; late onset of menstruation or early menopause, early ovariectomy or hysterectomy for ovarian disease or for fibroids, infantile type of uterus, undeveloped breasts, fibroids, pathologic overweight, masculine distribution of body and facial hair, mannishness, sexual anesthesia, thyroid disease.

Little importance could be attached to a history of nulliparity, as there can be so many causes for it, but if a woman had borne several children, that fact was used sometimes to discount somewhat any slight signs which she might have of hypogonadism.

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At first we were inclined to consider those women as normal whose pelvic troubles seemed to be due purely to gonorrhea or peritonitis following criminal abortions, but our impression later from the blood pressure findings was that these perhaps should have been included among the normal. The circulation to their ovaries may easily have been damaged.

CORRECTION OF THE DATA FOR DIFFERENCES IN AGE AND BODY BUILD

As is well known, there are big differences between the average blood pressure at the age of twenty and at the age of sixty and it would obviously be unfair to compare the blood pressures of any two groups of women unless we could correct in some way for differences in their age distribution. Similarly, we found that women of average weight tend to have blood pressures 10 mm. higher than those of thin women, and the overweights have pressures 12 mm. higher than those of the normal. It is obvious then, again, that it would be unfair to compare the pressures of, let us say, a group of more or less matronly married women with those of a group of thin single women. Statistical methods for making such corrections have been worked out, and they will be published later in one of the technical journals. Much of the previous work on hypertension is of little value because such corrections in the averages have not been made.

STANDARDS OF NORMAL

Let us first take the women who are considered to be sexually normal and divide them into four age groups, i.e., 16-29, 30-39, 40-49 and 50 plus. The average pressures for these groups are 122.1, 125.8, 135.3 and 154.4 mm. It is interesting to note that these averages are practically the same as those obtained on the freshmen at the University of California. Those figures were obtained by the palpatory method so they are about 5 mm. lower. In my office the pressures were taken by the auscultatory method and the patient was always reclining. In those individuals, in whom the pressure tended to vary a good deal, we took the average of several readings. It is interesting to note again how little the normal pressure rises in the twenties and thirties. The big change comes in the forties and fifties.

SINGLE AND MARRIED

I compared the mean pressure for single and married women (the "married" including the widowed, divorced and separated) because it seemed to me that a good many women might stay single because of sex deficiencies, mental and physical; and, if that were the case, we would expect to find a greater number of high pressures among the single.

Actually, our statistics do show that the women with pelvic troubles get married much later than do their normal sisters. Apparently they are handicapped in the early years when the factor of sexual attractiveness is most important. Later on, when marriage is contracted more soberly for companionship or home-building, they seem to be able to hold their own with the widows. As the women with poor ovaries have higher pressures, the single do average a little higher than the married.

Another interesting point came out when I studied the distribution of thin, normal and stout among the single and married. I found that the single women tend to get thin after fifty, while their married sisters are getting fat. Apparently the cartoonist's picture of the thin old maid rests on a firm biologic basis. Even the childless married women average a good deal heavier than the single.

THE SEXUALLY ABNORMAL

As we expected, the sexually abnormal showed pressures a good deal higher than those of the sexually normal. The average for the sexually abnormal one plus was 139.1 plus or minus .6 mm. and for the double plus was 143.9 plus or minus 1.7. The average for the normals was 133.8 plus or minus .7. These averages of course are for women of all ages grouped together. The differences between the normal and the abnormal are so much larger than their probable errors that the chances are hundreds of millions to one that they mean something.

VARIOUS FACTORS SUGGESTING SEXUAL INFERIORITY

Let us first consider the masculine distribution of body hair. As is well known, the pubic hair of a well sexed woman is sharply limited at the upper border of the mons veneris. Especially in the presence of an infantile type of uterus, we find hair extending up the midline to the navel or higher, just as it does in the males. We find also hair around the nipples and on the face. It is probable, too, that large amounts of hair on the legs and forearms are due to some insufficiency of the ovarian secretion.

The average pressure for women with such abnorfal hair was 139.0 plus or minus 1.2 mm. One interesting thing about them was that most of them were under thirty. It raises the question: what happens to them after that? Does the hair fall out or do they die off? That is something which must be studied in the future.

Women with fibrotic or definitely fibroid uteri had pressures averaging 142.0 plus or negative 1.6 mm. In some cases it may be thta the fibrotic type of uterus was due to the hypertension but certainly there must be some relation between the two conditions.

I included women with thyroid disease among the sexually abnormal because I have noted the frequency with which such troubles are associated with pelvic disease and with sexual anesthesia. Actually we find, just as Plummer did several years ago, that women with thyroid disease average considerably higher than normal. The figures for the different types of goiter were about 139 mm.

I could find no difference between the pressures of women with normal and abnormal menstruation. That may possibly be due to the fact that we could not separate the different types of menstrual disorder without getting groups which would have been too small for accurate statistical analysis.

The sexually anesthetic averaged 140.2 plus or minus 1.6 mm. which was decidedly abnormal. Those who had suffered the loss of one or both ovaries or of all their pelvic organs averaged about 139 mm.

No difference could be made out between the pressures of those women who had had children and those who had not. Similarly, no difference could be found between the pressures of those who had the menopause before fifty and those who had it after that.

DIASTOLIC PRESSURE

The diastolic pressures were much higher in the sexually abnormal than in the normals. The average pressures of the normal women at the different ages were 82.0, 83.5, 88.4 and 93.8.

DISCUSSION

We have seen now that women with poor ovaries or poor pelvic organs are very likely, early in life, to develop hypertension. The next question is: do they ever get it early when they have good ovaries? By early I mean in the years before thirty. The answer is probably "yes," but a careful analysis of the few cases which I could find in which hypertension appeared in girls and young women who seemed to be sexually normal, showed that their trouble was certainly not of the primary type but was secondary to severe kidney disease. One was that of a girl of nineteen with a pressure of 250/150, and an acute glomerulonephritis. Another girl was seen at the age of seventeen with a pressure of 220/160, and a beginning uremia. Another at twenty-five had a pressure of 220/140. A careful study of the women between thirty and thirty-nine with hypertension and normal pelvic organs made me feel that probably the ovaries in some of them were already losing enough of their strength so that a latent hypertension could emerge.

SUMMARY

The records from 1,230 women have been analyzed, and the average blood pressures have been calculated for women of different ages. As was expected, the sexually abnormal averaged considerably higher than the sexually normal. Single women were found to average a little higher than the married, because they have a larger percentage of the sexually abnormal in their ranks, especially in the earlier years of life.

A masculine distribution of body hair, sexual anesthesia, fibroids of the uterus, thyroid disease, and pelvic conditions requiring ovariectomy or hysterectomy were found to be associated with high blood pressure.

Abnormal menstruation, early menopause and pregnancy had no demonstrable effect.

Marked hypertension can be found in a few girls who seem to be normal sexually, but in those cases it is not of the primary type but is associated with severe forms of nephritis.

The evidence here presented supports the theory that the essential type of hypertension is a bodily peculiarity inherited equally by girls and boys, but ordinarily repressed in the girls by the ovarian or other related secretions. In men, and in women with defective pelvic organs, the disease generally makes its appearance shortly after puberty.

ADENOMYOMATA AND ECTOPIC ENDOMETRIAL GROWTHS

THEIR PRESENT STATUS*

R. W. Te Linde, M.D.
BALTIMORE, MD.
Instructor in Gynecology, Johns Hopkins University

The subject of adenomyoma and ectopic endometrial growths has probably occupied a more prominent place in the gynecologic literature in the past few years than any other subject. Viewed from the standpoint of pure pathology, it is a most interesting field and the various conclusions reached from the pathologic studies have modified our clinical ideas and changed our methods of dealing with these growths.

The subject is not a new one and I will attempt in this paper to present only the more important milestones in the development of our present views on the subject. As early as 1884 Schroeder, Herr and Grosskopf collected a total of 100 cases, in which glandular elements were described in myomata. In 1895 Cullen reported his first case of adenomyoma of the uterus and one year later Von Recklinghausen published his excellent work on the subject. Cullen, in 1903, reported 22 cases of adenomyoma and in 1908 brought out his book on the subject which deals with the subject most completely. In this publication he classifies adenomyomata of the uterus into three groups:

1. Adenomyoma of the uterus with the uterus preserving a relatively normal contour.
2. Subperitoneal or intraligamentary adenomyoma.
3. Submucous adenomyoma.

Let us consider the pathologic picture presented in diffuse adenomyoma of the uterus. The organ usually retains its normal contour unless complicated by ordinary myomata. It may be of normal size or two to three times normal size. It is extremely firm in consistency. On section of the uterus one finds the uterine cavity lined by endometrium which appears normal grossly. Beneath the mucosa is a zone of diffuse myomatous tissue with strands of muscular tissue running in all directions. Between these strands of muscle are islands of tissue which grossly appear like the cross section of the endometrium lining the uterine cavity. These are islands of endometrial stroma and glands. On close scrutiny tiny holes can be seen in this tissue, some of which appear like dark specks due to their bloody contents. Surrounding this myomatous zone is a peripheral zone of normal uterine musculature which blends gradually with the subadjacent zone. Adhesions on the surface of the uterus are frequent.

Microscopically the endometrium lining the uterine cavity appears normal. The myomatous zone shows smooth muscle strands, interlacing one another and between these strands are islands of endometrium. The glands which are surrounded by typical stroma vary considerably in size and are often cystic, due to distension with old and fresh menstrual blood. This endometrium undergoes the cyclic changes of the menstrual cycle under the influence of the corpus luteum and in a recent case which came under my observation, in which an adenomyomatous uterus was complicated by a tubal pregnancy, the islands of endometrium were changed into typical decidua. A similar case was reported by Cullen in his book on adenomyoma, published in 1908.

The two other types which Cullen describes, the submucous and subperitoneal or intraligamentary, are much rarer. He considers the submucous variety as one which arose intramurally and of which the uterus is attempting to free itself, as it does an ordinary submucous fibroid. The subserous variety he considers as an extension outward of the growth subperitoneally or between the folds of the broad ligament.

After thus briefly considering the pathology of diffuse adenomyoma of the uterus, an understanding of the clinical symptomatology will be simple. The characteristic increased menstrual flow is explained by the increased amount of menstruating endometrium which drains imperfectly into the uterine cavity. The discomfort at the menstrual periods, which in some cases is severe, is explained by the increased tension of the blood-containing endometrial cavities at the time of menstruation. If coupled with these symptoms we find on pelvic examination a very firm regular uterus of normal size or moderately enlarged, we have a very characteristic clinical picture.

Now let us consider the origin of the glandular elements in diffuse adenomyoma. In 1896, after a careful review of his own cases and the literature, Von Recklinghausen concluded that the glands were derived from the Wolffian duct. His conclusions were based on the supposed resemblance between the elements of the Wolffian duct and the glands of adenomyoma. Cullen, however, succeeded in tracing a continuity between the endometrial lining of the uterus and the deeplying endometrial islands in 55 of his 56 cases described in his book, and thus proved conclusively that the glands were of Mullerian origin, arising from the endometrium of the uterine cavity.

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In 1919 Cullen delivered an address before the Western Surgical Association, in which he described adenomyomata occurring in various parts of the body. He described the tumor as occurring in the following ten places:

1. Diffuse adenomyoma has already been discussed from a pathologic, clinical and etiologic point of view.

2. Adenomyomata of the rectovaginal septum form a very interesting group clinically. Histologically they are composed of smooth muscle and endometrium. Early they form a small adherent tumor in the mid-line but they later may spread out laterally and become very extensive. I will discuss them more fully later in the paper in the light of more recent work.

3. Adenomyomata of the uterine cornu are the small nodules seen with chronic salpingitis. They form an inflammatory etiology and are not true new growths.

4. Adenomyomata of the round ligament were first reported by Cullen in 1896 and several have been reported since. Clinically, a lump appears, usually in the region of the inguinal ring. Frequently a history of swelling and tenderness at the menstrual periods can be obtained. Upon removal and histologic examination the tumor is seen to be composed of endometrium and smooth muscle.

5. Uterine mucosa in the ovary has been reported several times. Russel, in 1898, reported a case and in 1919 Casler reported a case of a uterine tumor which resembled adenomyoma but histologically the stroma which invaded the uterine wall was devoid of glandular elements. Following a pan-hysterectomy, the patient continued to menstruate and four years later a cystic tumor of the ovary was removed which contained great quantities of endometrium, from which she had menstruated through a sinus tract into the vagina. I will further discuss endometrium in the ovary in the light of Sampson's more recent work.

6 and 7. Small adenomyomata in the uterosacral and ovarian ligaments of typical histologic architecture occur occasionally. They are of little importance clinically.

8. Endometrial growths of the sigmoid have been reported by Robert, Meyer, Cullen and Mahle and McCarthy in recent years. These may be so small as to be only of histologic interest or so large as to cause symptoms of obstruction and simulate carcinoma. The probable etiology and treatment of these I will take up later in discussing Sampson's work.

9. Endometrial growths in the abdominal scar following operations upon the uterus were reported by Cullen and Mahle and McCarthy. A recent case of mine typifies this form of endometrial growth. A woman of thirty-two had had a hysterectomy for fibroids two years before I saw her. One year following this she noticed a small tender lump at the lower end of her abdominal scar. This gradually increased in size until, when I saw her, it was about 5 cm. in diameter. The lump was painful and the patient volunteerd the information that on two occasions the pain had been worse during her menstrual period. The tumor was quite freely movable but did not have the bluish color which growths of this kind sometimes possess. Upon excision of the tumor and microscopic examination, it was found to contain smooth muscle and typical endometrium, many glands of which were dilated with blood. At the recent meeting of the American Gynecological Society, N. Sproot Heany reviewed the literature and reported several cases from his own experience of endometrial growths in the abdominal scar following cesarian section. There can be little doubt but that this form of endometrial tumor represents a transplant of endometrium deposited in the abdominal wall at the first operation.

10. Adenomyomata of the umbilicus are usually small growths which may increase in size at menstruation and occasionally discharge blood. Upon excising these growths one usually finds that the serosa in the umbilical region is perfectly smooth, indicating that they do not arise as implants upon the serosa, as Sampson believes the pelvic types of these tumors do. Halban has advanced the theory that these, as well as some of the other types of endometrial growths, arise as lymphatic implants just as malignant tumors, and others have held to the view that they represent embryonic deposits of endometrium, but certainly their origin is still not definitely proven.

Since the publication of Cullen's paper on the distribution of adenomyomata, we have seen endometrial tumors in the vagina and vulva. These were in parous women and may represent the transplantation of bits of endometrium into labor injuries, just as bits are transplanted in laparotomy wounds.

In September, 1921, appeared Sampson's paper on the perforating hemorrhagic cysts of the ovary. This was the beginning of a new epoch in our conception of the pathology of several types of endometrial growths. He called attention to the so-called "chocolate cysts" of the ovary which are lined with endometrium and the importance of which surgeons had overlooked these many years. He reported 14 cases which had occurred in the course of 178 pelvic operations.

Histologically these blood-containing cysts are lined with epithelium which closely resembles the epithelium lining the uterine cavity. Frequently beneath the epithelium there is typical stroma and often typical uterine glands. He concluded that these endometrial cysts at menstruation have bleeding into them just as into the uterine cavity; that at times these cysts rupture, and that adhesions form, due to the irritating effect of this menstrual blood. These adhesions studied histologically showed adenomata of the endometrial type in thirteen out of fourteen cases studied.

He suggests that the origin of these endometrial growths is analagous to the implantation of papillary cancer of the ovary onto the peritoneum and suggests this theory as an explanation of the origin of these various adenomata occurring throughout the peritoneal cavity, such as the rectovaginal septum, the sigmoid, uterosacral ligament, etc. This theory of Sampson's was strongly substantiated by the case reports in his next article, in which he reported twelve cases of intestinal adenomata of the endometrial type, all associated with blood-containing cysts of the ovary, which, in all except one instance, was proven histologically to be of the endometrial type.

These adenomata, which vary in size from a few millimeters to growths large enough to partially obstruct the bowel, occur chiefly in the lower abdomen, the sigmoid with its epiploic appendages, the cecum, the appendix and the cul-de-sac invading the rectal wall. That they arise as implantations from the ovarian hematomata, according to Sampson, is shown by the fact that the adhesions which invariably accompany the hematomata contain endometrium, and further by the fact that the adenomata are usually situated in proximity to the ovary which contains the endometrium. For example, of the eight cases of adenomata involving the rectum and sigmoid or its appendages or mesentery, the hematoma was situated in the left ovary in six, and of the four cases of involvement if the appendix, the ovarian hematoma was situated on the right in all four.

That endometrium may be transplanted successfully has been shown experimentally by the work of Victor Jacobson who showed that endometrium of rabbits transplanted into ovary or pelvic fat of the same animal will grow as long as seventy days and probably much longer. He produced adenoma-like growths, which during pregnancy grew more rapidly. As further proof of the transplantation theory, we have the cases of adenomatous growths of endometrial character which occasionally occur in abdominal scars after pelvic operations, in which the uterus is either opened or sutured, as in ventral fixation.

As to how the endometrium gets into the ovary we can assume two possibilities: First, that it represents embryologically misplaced endometrial tissue; and, second, that it is cast out through the tubes and implanted on the surface of the ovary at the time of menstruation. Sampson is inclined to the latter view for he frequently has seen blood-containing epithelial elements in the tubes of women operated upon during menstruation. An objection which has been raised to this is the fact that the elements of the endometrium cast off during menstruation show definite signs of degeneration and this is not the type of tissue which would readily "take" in transplantation.

Robert Meyer attempts to explain the origin of these adenomatous growths of the pelvis upon the basis of metaplasia of epithelium of various sources, chiefly that of the peritoneum, due to some irritation. The objection to this as the explanation of their source has been raised that such a metaplasia is unknown in the male sex. To overcome this objection Lauche has added his hypothesis, that the ovarian hormone is essential to the metaplasia. To the author it would seem difficult to explain the presence of stroma which is histologically identical to that of the endometrium of the uterine cavity upon this hypothesis.

Clinically, the smaller of these intestinal adenomata may be of little interest, but even these may become of much interest because of the adhesions associated with them which may tie the uterus back or kink the bowel. The larger adenomata, on the other hand, may of themselves cause partial obstruction which may become aggravated with each menstrual period. The syndrome presented by involvement of the rectovaginal septum is quite characteristic: First, the age of the patient which is usually between thirty and the menopause; second, dysmenorrhea of the acquired type; third, palpation of a mass or induration in the cul-de-sac; fourth, disturbance of intestinal function during menstruation; fifth, palpation of an adherent ovary or a small ovarian cyst.

Now let us consider the method of dealing with these intestinal adenomata. On entering such a pelvis one should first make a careful inspection of the ovaries, uterus and intestines to confirm the diagnosis and determine the extent of the process lying in the pelvic region. The smaller intestinal growths usually require no treatment in themselves after properly dealing with the pelvis. The conservatism or radicalism in dealing with the pelvic organs depends of course on the age of the patient, the desirability of having children and other accompanying pathology. In the larger intestinal growths it is first necessary to make a differential diagnosis between this condition and cancer, using frozen sections if necessary.

Formerly, when the rectovaginal septum was involved, it was usually customary to do a panhysterectomy with removal, if necessary, of a portion of the anterior rectal wall. Inasmuch as the growth was sometimes very extensive in the pelvis, involving the ureters in a solid growth, this procedure meant a very extensive pelvic dissection and at times was very shocking to the patient. In Sampson's earlier writings, however, he advocated in these cases simply doing a supravaginal hysterectomy, removing all ovarian tissue with the uterus. This he suggested on the theory that, if the ovarian tissue is removed, the endometrial tissue will atrophy, as it does in the uterus after the menopause. That this hypothesis has some foundation in fact has been shown by Graves in his recent paper before the last meeting of the American Gynecological Society. He reported four cases of endometriosis, involving in two the rectovaginal septum, in another the parametrium, and in another the abdominal scar. Supravaginal hysterectomy, with ablation of all ovarian tissue, was done in each case without removal of the endometrial growth, except in the case in which the abdominal wall was involved.

In his first case the tumor of the rectovaginal septum had entirely disappeared four years after operation. In his second case an endometrial tumor of the parametrium had entirely disappeared six months after operation. In his third case there was no recurrence of the endometrial tumor of the abdominal scar after excising it and removing both ovaries and the uterus, whereas it had recurred previously after excision when the ovarian tissue had not been removed. In his fourth case, which was a very extensive endometriosis of the pelvis, there was marked retrogression of the process ten months after operation.

There is, however, some evidence that this retrogression following supravaginal hysterectomy and ablation of the ovaries does not always take place, notably the case reported by Cullen. In this case there had been a supravaginal hysterectomy with removal of both ovaries two years previously and in spite of this the pelvic condition had grown worse. Graves suggests that the difference in the outcome between his cases and that of Cullen's may be explained upon a difference in clinical malignancy of the tumors and that at times a point may be reached, where the endometrial tissue continues to grow in spite of the removal of the ovarian hormone. At any rate, it would seem that, if the extent of the growth is very extensive so that its complete extirpation would mean an extensive shocking operation, it would be better to proceed more conservatively by doing a supravaginal hysterectomy with ablation of the ovaries in the hope that the endometrial growth will retrogress.

In conclusion, I will quote a recent letter from Dr. Cullen to Cuthbert Lockyer, expressing his views on the present status of our knowledge concerning these growths:

"To sum up, the glands of adenomyomata of the uterus usually develop from the uterine mucosa.

"Adenomyomata of the round ligament appear to be due to embryonic inclusions.

"Adenomyomata of the umbilicus are evidently due to embryonic inclusions.

"Adenomyomata in abdominal scars are due to transplants.

"Adenomyomata developing on peritoneal surfaces in or near the pelvis are still 'no man's land' with much evidence that they owe their origin to transplants, as advocated by Sampson."

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NAMES FIFTEEN GREATEST PHYSICIANS

The fifteen greatest physicians of all time are named by *Hygeia*, popular health magazine published by the American Medical Association, in its March issue. The names are taken from a list recently made by medical historians in an effort to name the five greatest contributors to the advancement of medicine.

Some of these men are not really physicians, in the sense that they have practiced medicine or have obtained a medical degree. Their contributions are in fields closely related to medicine. *Hygeia's* list is as follows:

1. Hippocrates, father of modern medicine, whose school and writings formulated our knowledge of medicine.

2. Galen, who described the action of the heart valves, elevated the status of the medical profession and collected the knowledge of his time in a system of medicine which was followed by physicians for centuries.

3. Leonardo da Vinci, artist and inventor, who contributed greatly to the science of anatomy.

3. Vesalius, father of modern anatomy.

5. William Harvey, representative of the renaissance of medicine, who first described scientifically the circulation of the blood.

6. Sydenham, greatest figure in medicine of seventeenth century, who wrote excellent descriptions of several disease conditions.

7. John Hunter, father of surgery.

8. Auenbrugger, who first described the method of tapping the chest for the determination of conditions beneath the skin.

9. Laennec, who first described use of the stethoscope for listening to sounds within the chest.

10. Pasteur, father of the conception of bacteria as the direct cause of many diseases.

11. Robert Koch, discoverer of the tubercle bacillus, who established bacteriology as a science.

12. Lister, who showed how bacterial infection may be prevented.

13, 14 and 15. James Young Simpson, William Morton and Crawford Long, who first made use of anesthetics and made surgery painless.

CANCER OF THE CERVIX UTERI

VARIATIONS IN THE MALIGNANCY OF THE DIFFERENT VARIETIES*

Karl H. Martzloff, M.D.
PORTLAND, ORE.

Although medical literature pertaining to cancer of the uterine cervix has for years been replete with reports of surgical statistics, descriptions of various operative procedures, and in recent years premature publications concerning the use of radium in this lesion, there has been little attention given to its pathology other than that which has been known for probably two decades. Cullen, in his wonderfully comprehensive monograph on "Cancer of the Uterus,"[1] covered the subject so well that there apparently remained little to be added in the English language to our knowledge of the morphologicopathologic aspects of this malady.

At about the time of Cullen's work, Krompecher produced his important work on epidermoid cancer, ascribing to basal cell cancer its origin from the lowermost layers of the epidermis and in subsequent publications elaborating the application of his observations, [2, 3, 4] so that he is willing to identify certain epidermoid tumors as arising from the spindle cell or malpighian layer, others from the rete layer with round cells and the highly malignant epidermoid neoplasms from the more superficial or spinal layer or, as it is often termed, the squamous layer. That this concept of epidermoid carcinoma was not applied to cancer of the uterine cervix is indeed strange. It is true that Schottlaender and Kermauner[5] in 1912 recognized various types of cancer cells which they designated in their monograph as ripe (rief), partially ripe (mittelrief) and unripe (unrief). They nevertheless did not draw any conclusion or suggest an inference that there may be variations in malignancy, as indicated by the various types of cancer cells which they segregated under the above terms.

In 1913, Leigner[6] studied cancer of the cervix with the view of determining variations in its malignancy from its histologic appearance. He concluded that no such determination could be made. In 1920 and 1921 Broders[7] in a most detailed study demonstrated the distinct variations in malignancy of cancers of the lip, as indicated by the morphology of the predominating type of cancer cell. This same author in 1922 studied and demonstrated the variations in malignancy of cancers of the genitourinary organs, as indicated by the morphology of the predominant type of cancer cell. In this paper Broders[8] also considered cancer of the cervix and his findings at the Mayo Clinic as compared with those at the Johns Hopkins Hospital will be given in a subsequent paper.

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* Read before Central Willamette Medical Society, Corvallis, Ore., Dec. 3, 1925.

At the time that I began this investigation[9] in the fall of 1920 Broders' work on cancer of the genitourinary organs had not been published. In reviewing the literature prior to publishing, in 1923, the results of my investigation, his report was entirely overlooked, because of its not being indexed under either "uterus" or "cervix." I desire, however to take this, my first opportunity of acknowledging Broders' priority by publication[8] of establishing the differences in malignancy of epidermoid cancer of the uterine cervix, as indicated by the predominating type of cancer cell.

Our hypothesis, when this study was begun, was that, if basal cell cancer with its relatively low grade of malignancy exists on epidermal surfaces of the body elsewhere, why should it not occur in the cervix uteri and warrant an equally favorable operative prognosis? We also felt that the epidermal integument of the cervix differed morphologically in no essential way from skin except for its absence of a stratum corneum, dermis, dermal glands and dermal appendages. In short, why should epidermoid cancer of the cervix differ from epidermoid cancer occurring in other situations?

The object of this study, therefore, was to discover, if possible, whether in this large and common group of epidermoid or squamous cell carcinoma of the cervix the histomorphology of the predominant types of cancer cells might signify anything relative to the malignancy of the disease. Because of the relatively poor prognosis as to an eventual operative cure which can be given in these cases, it was thought that any information such an investigation might give would be of definite value.

Our data have been gathered from the records of 387 patients in the wards of the Johns Hopkins Hospital prior to the year 1920. This figure does not represent the total number of cases of carcinoma of the cervix treated in the hospital up to 1920. It includes only those cases of which we have *complete records together with all pathologic material.* Of this number the following table (Table I) shows graphically the number traced and their distribution as to operability. The term operability is used here to indicate whether or not the patients were considered to be within the scope of a possible operative cure and were, therefore, subjected to an operative procedure. The figures in table I do not, therefore, give a true index of the actual operability of the cases in this study.

TABLE I.

Showing the number of patients operated upon and traced in this series.

Total No. operated upon	290	Total No. inoperable	97
Operated upon but not traced	87	Inoperable cases not traced	43
Operated upon and traced 203 or 70.2%		Inoperable cases traced 54 or 55.1%	

Total number traced—257 or 66.3% of 387 cases.

PLAN OF STUDY

Only cases of definite cancer were studied. Patients that were operated on for cancer in the past years and who on restudy did not show unquestionable cancer have been omitted, even though many of them are living and well. We do not feel that we are able to identify so-called *precancerous lesions* and none of the cases in this series can be classed in this group or in a group which might be designated as *questionable early cases.* The cases of early cancer all show a definite carcinomatous invasion, none of them apparently as early as some other reported cases.[10, 11]

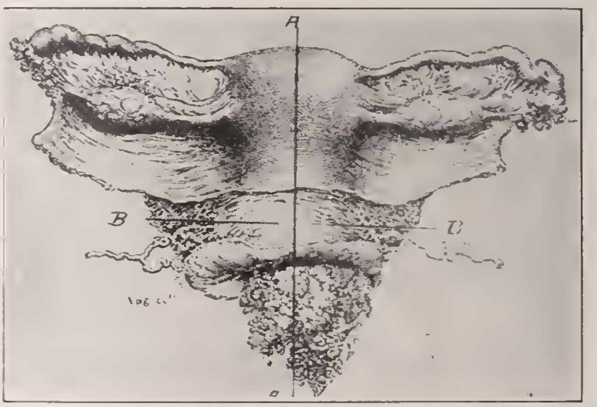


Fig. 1. A posterior view of a uterus with a cervical carcinoma. The line A.A. indicates the direction in which blocks were cut in order to study the extent of the process both anteroposteriorly and superior-inferiorly. The lines B.B. indicate the direction and approximate depth of the blocks taken throughout the broad ligament regions in order to study the lateral progress of the neoplastic process. (Modified after J. G. Clark.)

In order to avoid any bias or preconceived clinical impression which might unwittingly influence our attitude, the pathologic tissues from the entire series were first studied. Following this the clinical phase of each case was analyzed and an attempt made to locate the patient and her family physician in order to ascertain the ultimate result.

Inoperable cases, or cases in which no operation was performed, were studied only when the sections of tumor which were used for diagnosis were available.

Operable cases. In this group blocks were made from the entire length and anteroposterior thickness of uterus, cervix and vaginal cuff (fig. 1, A.A.), when the two latter were not entirely destroyed by cancer. The lateral extension of the process was studied by making blocks of the entire pericervical area, including a wide margin of cervical tissue proper. These blocks were cut at right angles to the longitudinal axis of the cervix as indicated in figure 1 (B.B.).

Numerous sections were taken from each block but no attempt to study serial sections was made, because of the expense and the interminableness of such a task. Blocks and sections were also made from the tubes and ovaries when they were removed, which was practically always the case. The results of twenty-four autopsies are also included in this study, ten of the autopsies being done in inoperable cases and fourteen autopsies on patients previously operated upon.

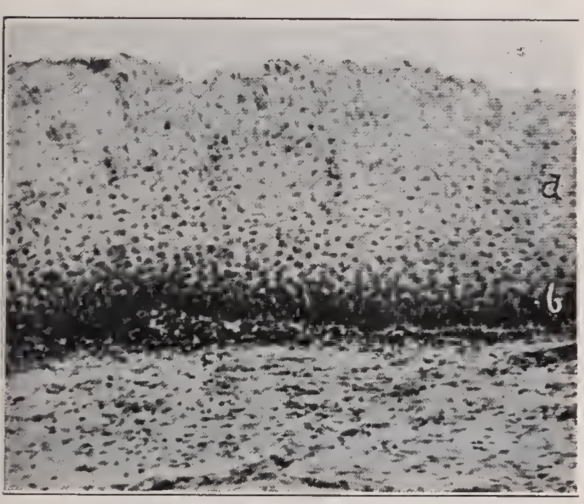


Fig. 2. Normal stratified cervical epithelium. The layer of cells indicated by "a" are the characteristic "prickle or spinal cells" seen in normal epidermis from any situation. As can be distinctly seen, the cells are large, polyhedral, have a distinct cell membrane, and a very pale eosin-staining cytoplasm. At "b" the cells in the normal cervical epithelium neither resemble the cells at "a" nor do they resemble the cells of the stratum germinativum. They are, so to speak, cells morphologically of an intermediate or transitional type. The stratum germinativum is not indicated here because it is not well brought out in this photomicrograph.

CELL TYPES STUDIED

In addition to the epidermoid or squamous cell carcinoma, twenty-one cases of adenocarcinoma of the cervix were studied in order to bring our mortality statistics up to date. The cell types were not studied in the adenocarcinomas.

Almost at the beginning it was seen that the morphology of the cancer cells in the epidermoid variety, for the purposes of description, could be arranged into three groups. The designatory terms used in referring to the cell types which represent one or the other of the three groups are merely terms of description and are meant in no way to complicate or modify present anatomic or pathologic nomenclature. The cell types representing the three groups of cancer cells encountered have, therefore, been designated as:

The Spinal Type of Cancer Cell. In this variety the cancer cells (figs. 3, 4) so designated are morphologically similar to the cells seen in the upper portion of the stratum mucosum of ordinary cervical epithelium as shown in figure 2, a. These cells are usually polyhedral in shape with well defined cell outlines. The nuclei are fairly large, take only a moderately intense hematoxylin stain, frequently have nucleoli and are separated rather widely from each other by an abundant quantity of

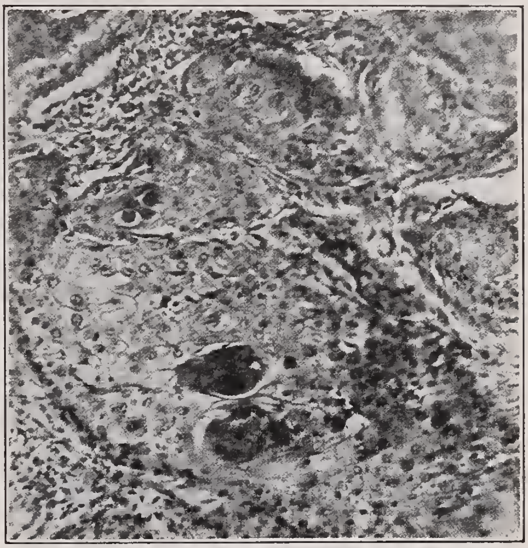


Fig. 3. (Gyn. Path. No. 12125.) Spinal cell cancer with epithelial pearls.

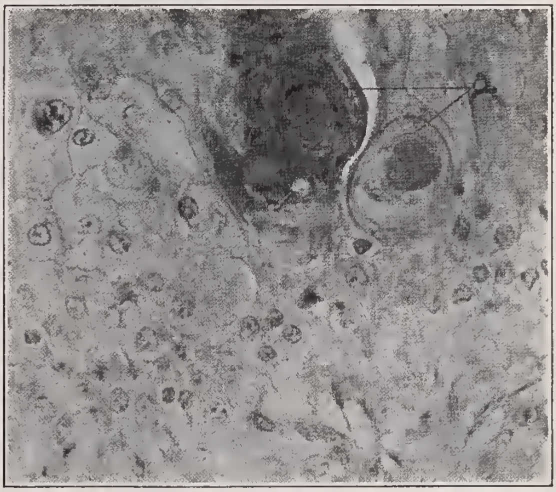


Fig. 4. (Gyn. Path. No. 12125.) A high power of figure 3, showing epithelial pearls at "a." To the left of the epithelial pearls are seen typical spinal cells with well defined cell membrane, polyhedral outline, and large quantity of pale eosin-staining cytoplasm.

surrounding cystoplasm which takes a rather pale eosin stain.

The Transitional Type of Cancer Cell, by far the most common, corresponds most nearly in appearance to a well defined layer of cells (fig. 2, b) seen in normal cervical epithelium, which is limited above by the spinal cell layer just described and below by the distinct basal layer of spindle-shaped cells. Because of their resemblance to this intermediate group of cells we are designating them as cells of the transitional type. The cells in this group (fig. 5) have a very faint or undefinable cell membrane. Their nuclei take a deep blue hematoxylin stain, frequently have nucleoli and are rather closely placed, being separated by a deep eosin-staining cytoplasm, much less in quantity and more deeply staining than that separating the nuclei of the spinal cell group. These cancer cells correspond most probably to the variety which Krompecher[4] refers to as round cell cancer and which he regards as a variety of basal cell cancer.

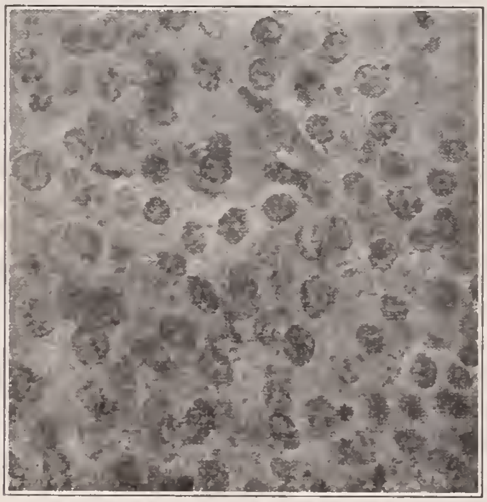


Fig. 5. (Gyn. Path. No. 13370.) Showing the cells characteristic of the transitional type of cancer.

The Fat Spindle Type of Cancer Cell (figs. 6, 7) is not uncommon in combination with other forms and is, as the term indicates, a broad, spindle-shaped cell. The growth would probably be termed "basal cell cancer" by many observers; in fact some of the cancers in this study composed of this type of cell have been designated as basal cell cancers by certain excellent pathologists, and Krompecher[4] unqualifiedly traces their origin to the stratum germinativum and to the cylindrical epithelium of glandular structures. Others (MacCallum[12]), however, are not so willing to ascribe the origin of various histologic types of epidermoid cancer cells to morphologically similar layers of the epidermis. Indeed, it would seem almost futile to prove, by postmortem or postoperative histologic methods on fixed tissue, the histogenesis of epidermoid cancer from any particular layer of the epidermis. It is not our purpose in this paper to imply in any way the histogenesis of any particular group of cancers from any particular layer of the cervical epithelium. What we wish to do is to call attention to the histomorphology of the cervical epidermoid cancers and the resemblance existing between them and morphologically similar cells in the normal cervical epidermis. The term "basal cell" is, therefore, purposely not used in this study, because it immediately suggests an origin from the stratum germin-

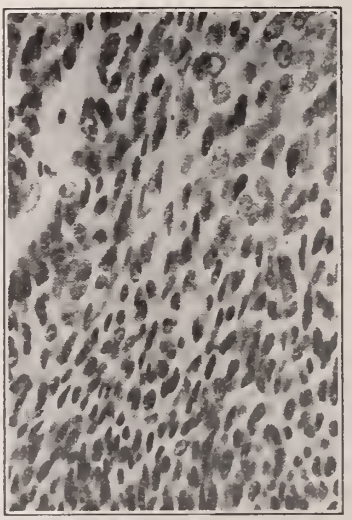


Fig. 6. (Gyn. Path. No. 22556.) Fat Spindle cell cancer showing the cells with their broad and elongated nuclei, closely placed and with little intervening eosin-staining cytoplasm.

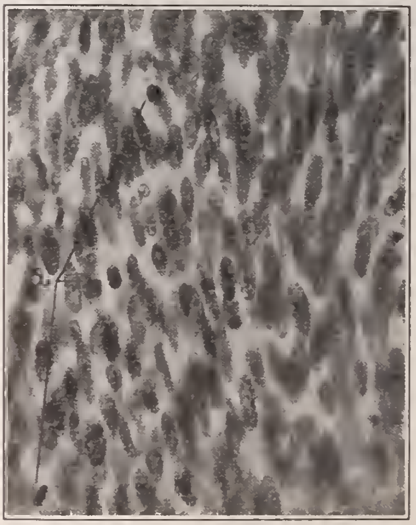


Fig. 7. (Gyn. Path. No. 22556.) Fat Spindle cell cancer from the same specimen as the section shown in figure 6. This photomicrograph shows even more distinctly the long, broad cells. At "a" are mitotic figures which do not appear very distinct in this picture.

ativum and an idea of benignity which these tumors do not possess when situated in the cervix uteri.

For this reason the term *fat spindle cell* has been used to designate these long and comparatively broad cells which have markedly hematoxylinophilic nuclei, sometimes containing nucleoli, rather closely packed and separated by only a small quantity of eosin-staining cytoplasm. However, the cytoplasm surrounding the nucleus in this type of cancer appears to be more abundant than that seen in basal cell carcinoma of the skin of the face, with which it has been compared.

A scirrhus-like carcinoma was observed several times, appearing as isolated slender cancer cells ramifying between strands of dense, fibrous stroma, resembling very closely scirrhus cancer seen in other situations. This group after being studied separately was found to resemble the transitional cell type of cancer so closely in malignancy that it has been included in the latter group.

Incidence of the various cancer cell types. As this study progressed it was seen that, excluding adenocarcinoma of the cervix, twelve groups, representing various combinations of the three different cancer cell types, presented themselves as shown in Table II.

TABLE II.

To show the various cell types of cancer and their different combinations as noted in this study.

The occurrence of epithelial pearls is also tabulated.

Predominant cell type	Combinations of cell types		Incidence per cent.	Occurrence of ephitelial pearls Incidence per cent.	
		No.		No.	
Spinal Cell	Spinal and Transitional	39	10.1%	18	46% of 39.
	Spinal	14	3.6%	8	57.1% of 14.
	Spinal, Transitional and Fat spindle	7	1.8%	5	71% of 7
	Total	50	15.5%	31	51.6%*
Transitional	Transitional and Fat spindle	63	16.3%	4	6.3% of 63.
	Transitional and Spinal	83	21.4%	25	30.1% of 83.
	Transitional Fat spindle and Spinal	30	7.7%	10	33 3% of 30.
	Transitional	83	21.4%	6	7 2% of 83.
	Total	259	66.8%	45	17.3%*
Fat Spindle	Fat spindle and Transitional	29	7.4%	1	3.4% of 29.
	Fat spindle	18	4.6%	3	16.6% of 18.
	Total	47	12.0%	4	8.5%*
Adenocarcinoma	Adenocarcinoma	21	5.4%	0	0

* Of this group had epithelial pearls.

In studying the various phases of the pathology of this condition it is well to take each phase in order and briefly ascertain what significance the different types of cancer cells possess as to rapidity of growth, power of extension, etc., and what this may signify as to the ultimate outcome in a given group of cases. Briefly, in studying the extent and apparent rapidity with which cancers of the various cell types involve the cervix, it is difficult to demonstrate any marked difference between the various types. In this relation one can only be astounded and profoundly alarmed to note such extensive involvement at a relatively early stage of the disease as estimated by the duration of symptoms.

The role which vaginal extension of the cancer plays I am now studying and, therefore, am not in a position at this time to make a definite statement.

Involvement of the corpus uteri is not uncommon and occurred in 26.5 per cent of all the cases studied in this series. It is noteworthy that this involvement occurred in only those cases in which the entire length of the cervix was involved, so that of the 196 cases showing complete longitudinal involvement of the cervix 81 (41.3 per cent) show secondary uterine extension.

Associated Broad Ligament (Paracervical) Involvement. Secondary involvement of the broad ligament either by direct extension or metastasis of the cervical neoplasm was observed in 120 cases. The relation between the thickness of the cervical involvement and the broad ligament involvement is given in Table III. No broad ligament involvement was noted in the cases where less than one-third of the thickness of the cervix was implicated.

TABLE III.

Showing the relation of broad ligament involvement to the thickness of cervix involved in cancer, where one third or more of the cervix is so involved.

Thickness of crevix involved in cancer	Number of cases	Number of cases of bd. lig. involvement	Per cent of cases with bd. lig. involvement
One third to one half	20	3	15% of 20
One half to two thirds	15	3	20 % of 15
Entire thickness	189	114	60.3% of 189
Total	224	120	53.6% of 224

Although out of a total of 301 cases 120 (39.1 per cent) showed broad ligament involvement, the latter figure assumes still more important proportions when studied with relation to the 224 cases, in which one-third or more of the thickness of the cervix was involved in cancer, the incidence now rising to 53. 6 per cent. The particular significance of this is realized when, as will be shown later, no patient in this series with broad ligament involvement was cured by operation.

To compare the incidence of broad ligament involvement in relation to the predominant type of cancer cell and the duration of the disease, Table IV was prepared but is here omitted on account of its complexity. From the figures in Table IV it appears that, while the percentage incidence of cancer of the various predominant cell types is roughly parallel for the different disease levels, the same cannot be said for the percentage incidence of broad ligament involvement. Particularly is this true for the early months of the disease, so that in summarizing the total incidence of operated or autopsied cases and the corresponding broad ligament involvement for the various cell types for the first six months of the disease, the result is as shown in Table V.

TABLE V.

Summarizing Table IV, for the first six months in order to show the incidence of the cases as they came to this clinic and their corresponding incidence of broad ligament involvement in operated or autopsied cases.

Predominant cell type	Total No. oper. or autop. in first six months	Total No. with bd. lig. invol. in first six month period	Total incidence % of oper. or autop. cases in first six months	Total incidence % broad lig. involved in first six months.
Transitional Total number—200	140	45	70%	32.1%
Fat Spindle Total number—33	18	7	54.5%	38.8%
Spinal Total number—49	29	2	59.1%	6.8%
Adenocarcinoma Total number—19	6	2	31.5%	33.3%

The outstanding fact in this summarization of cases in patients who came to us during the first six months of their disease is the very low comparative incidence percentage of broad ligament extension in the cancers of the predominant spinal cell type. This small percentage of broad ligament involvement obtains, despite the high incidence percentage (59.1 per cent) of all patients with spinal cell cancer. This incidence during the first six months, of patients with spinal cell type of cancer, is roughly parallel with that of the transitional cell type (70 per cent) and the "fat spindle" cell type (54.5 per cent). However, we find that, while in the fat spindle cell type for the first six months the incidence percentage is lowest for the whole group of epidermoid cancers, nevertheless the frequency of broad ligament involvement is highest (38.8 per cent) in this group of neoplasms. The adenocarcinomas, while showing a comparatively low total incidence in Table V have, on the other hand, a comparatively very high incidence of broad ligament involvement.

In brief, of all the patients, excepting those with the spinal cell type of cancer, who are seen during the first six months of their disease, one-third or more have extension of the malignant process beyond the cervix into the pericervical tissues.

The relation of broad ligament involvement to the duration of life after operation is also interesting. No patient in this series in whom broad ligament involvement was noted is living today, all having died of recurrent carcinoma. The usual duration of life after operation of cancer cases with broad ligament involvement is considerably less than one year. However, there are exceptions, so that one cannot be too sweeping in offering an early hopeless prognosis in these cases.

In this series twenty patients with broad ligament involvement lived one year or more after operation. Of these ten lived one year and then died of recurrent cancer, half of these belonging to the spinal cell variety of cancer and the remainder to the transitional cell type.

Of the ten remaining patients three lived two years, the cancer in this group being of the transitional cell type. Three lived three years, the cancer types here being adenocarcinoma, spinal cell cancer and the transitional cell type. One, in whom the transitional cell type was predominant, lived five years after operation, and three with the spinal cell type lived respectively 6, 8, and 12 years after operation, before dying of recurrent cancer.

As regards the extension of cancer beyond the confines of the cervix one may say that, irrespective of the predominant type of cancer cell, this extension is, with the exception of vaginal and uterine extension, uniformly prohibitive of an ultimate operative cure.

Concerning the role which concomittant pelvic lesions might play in the production of cervical cancer, I may here briefly enumerate and dispose of some of those that for one or another reason have excited unfounded suspicion as predisposing causes. *Endometritis* in the true sense of the term was observed in only 11 cases (5.4 per cent) and in five of these the cervical cancer had extended into the corpus uteri, so that the incidence of endometritis here is only slightly greater than that reported by Cullen in the routine examination of uteri over a period of four years at the Johns Hopkins Hospital.[13] *Hyperplasia of the endometrium* is a condition frequently and incorrectly diagnosed when nonexistent and when actually observed it is often termed "chronic interstitial or polypoid endometritis."[14] This condition was first accurately described by Cullen[15] in 1900 and has since been referred to by him, as well as by other members of his staff. A paper by Novak and Martzloff[16] gives a comprehensive review of this subject as encountered at the Johns Hopkins Hospital. In this present study hyperplasia of the endometrium was observed in only 5 (2.4 per cent) of our series and can in no way be construed as a factor in the causation of cancer. *Endometrial polypi* are purely casual in their relation to cancer of the cervix. The same, I think may be said for *myomata uteri* which are not infrequent and purely incidental findings in many women past 30 years of age and were observed in 9 per cent of our cases.

Numerous other associated pathologic lesions noted in this study are altogether irrelevant as predisposing factors in the production of cancer. *Syphilis* may here be mentioned as occurring in 8 (6.8 per cent) of 116 cancer patients on whom Wassermann reactions were performed, and its incidence is about that occurring in any large clinic, where ward patients form the bulk of the hospital population. This is rendered even more plausible, when one considers that a large percentage of these patients were negroes. One cannot, therefore, attach much significance to the role of syphilis as an etiologic factor in the mechanism of cancer production in the cervix uteri.

THE PRIMARY SYMPTOM OF CARCINOMA CERVICIS UTERI

a. *Metrorrhagia,* under which we included everything from a mere constant bloody stain on the underwear to profuse intermenstrual hemorrhage, was by far the most frequent primary symptom, occurring in 65.8 per cent of the cases. This includes three cases in which the primary complaint was given as "bleeding after intercourse."

b. *Leucorrhea.* Here have been included only the cases where the leucorrhea was totally different from any previous discharge. It was usually of a thin, serous character and when of any duration was most often malodorous. In 58 cases (12.4 per cent) such a leucorrhea was the leading symptom. A brownish or blood-stained vaginal discharge was described by 46 patients (11.9 per cent) as their first symptom.

c. *Menorrhagia* was recorded as the primary complaint by 22 patients (5.7 per cent). In five cases not included in the above twenty-two, where the patients were at about the age for their menopause, the primary symptom was the recurrence of "periods every two to three or three to four months," finally terminating in a constant uterine hemorrhage.

d. In ten patients (2.6 per cent) the *primary symptoms* were such as not to suggest carcinoma of the cervix. Briefly they were as follows:

Case 1. *Pain* in the left hip for three months. Watery vaginal discharge for three weeks before entering the hospital. *Findings*: Inoperable cancer predominately of the transitional cell type with some spinal cells. Metastases in the lumbar glands.

Case 2. *Symptoms*: Backache and bearing down feeling in pelvis for eight years. *Findings*: Cervix on palpation suspicious of malignancy. Diagnostic currettage followed by radical operation several days later. Cancer limited to pars vaginalis, predominantly of the transitional cell type with some spinal cells. Patient living and well twenty-two years after operation.

Case 3. *Symptoms*: Prolapsus uteri.

Case 4. *Symptoms*: Pain in back and stomach for six months while pregnant. Died of recurrent cancer seventeen months after operation.

Case 5. *Symptoms*: "Rundown condition" for five months. *Findings*: Transitional cell cancer involving part of vagina and entire length of cervix.

Case 6. *Symptoms*: Amenorrhea for three months. Then pain and bleeding after intercourse. *Findings*: Inoperable cancer.

Case 7. *Symptoms*: Abdominal pain which was due evidently to a salpingitis. *Findings*: Predominantly transitional cell cancer with some spinal cells and epithelial pearls limited to the pars vaginalis.

Case 8. *Symptoms*: Pain suggestive of renal calculus. *Findings*: Portion of vagina with entire length of cervix involved in cancer predominantly of transitional cell type with some spinal cells.

Case 9. *Symptoms*: Pain in left groin for one year with swelling of labia. *Findings*: Inoperable transitional cell type of cancer.

Case 10. *Symptoms*: Acute urinary retention. Later partial urinary incontinence for one year. *Findings*: Inoperable cancer of transitional cell type.

In each of the foregoing ten cases the patient had been asked specifically concerning intermenstrual bleeding, etc., and in each instance the reply had been negative.

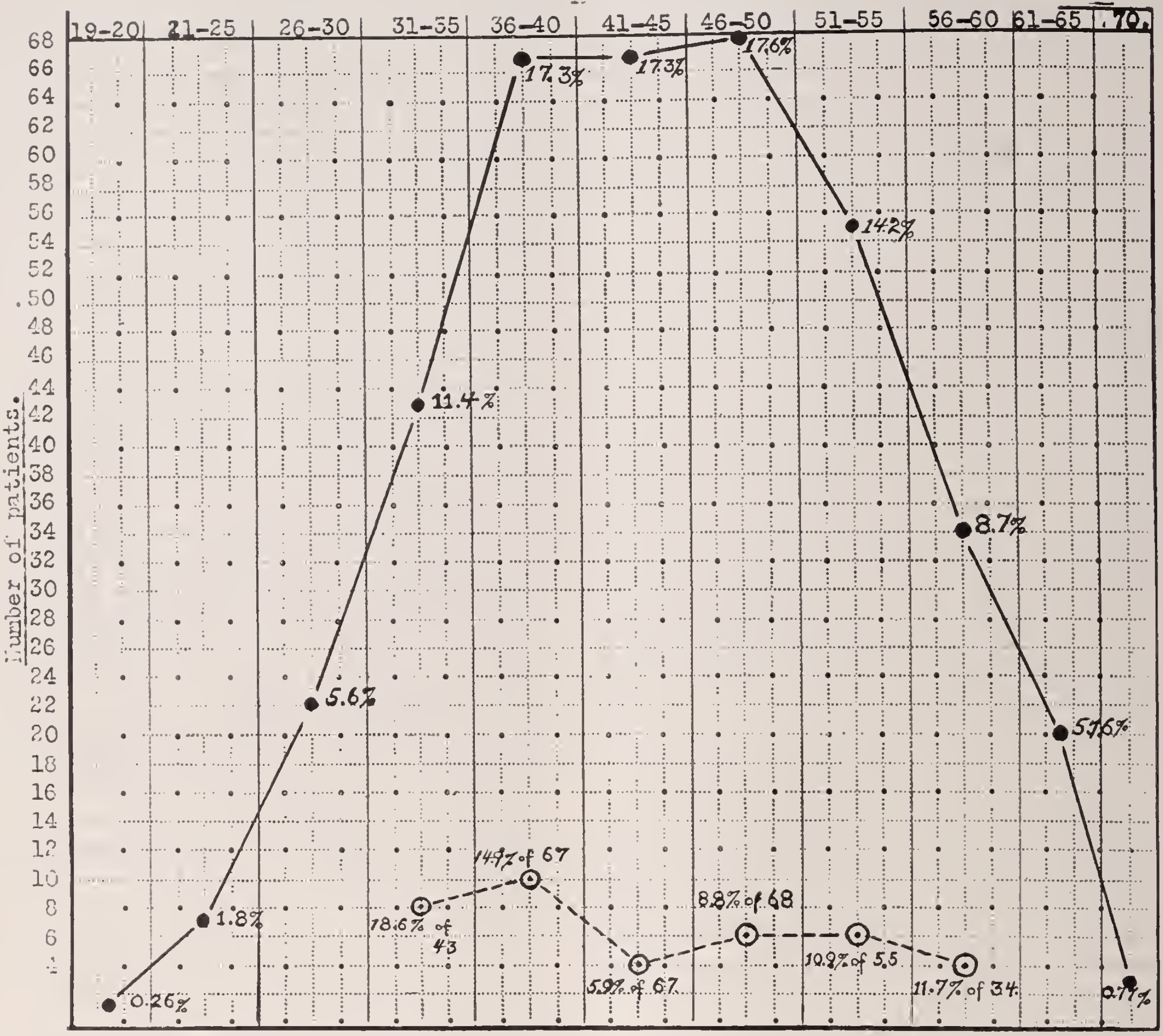
e. *Pain.* In not a few instances the patients complained of pain in addition to their other symptoms. Sometimes pain was a primary symptom soon followed by other and more definite signs. The pains were so varied and of such a common order as to be encountered in almost any variety of gynecologic patient not afflicted with cervical carcinoma. So frequently was there an accompanying inflammatory process which might have accounted for this complaint that the importance of pain as a primary symptom of carcinoma cervicis uteri in this study dwindles almost to imperceptible significance as a warning symptom.

AGE INCIDENCE OF CARCINOMA PATIENTS

Unlike cancer in other situations the incidence of cancer of the cervix assumes truly alarming proportions in comparatively young women in this study. Especially is this true of the negro women, 14.8 per cent of whom in this series developed cancer between the ages of 26 and 30 years, whereas for the corresponding age the incidence among our white patients was 2.75 per cent.

TABLE VI.

Ages (in years) inclusive.



Showing graphically the age incidence of the 387 carcinoma patients in this series, as well as the age incidence of the "cured" patients.

● — ● = Age incidence of cancer patients.
⊙ — ⊙ = Age incidence of cancer patients who are living and well, "cured."

In general, between the ages of 19 and 35 inclusive, the carcinoma incidence among negro women in this series was 18 per cent higher than among the white patients, while from the age of 36 to 70 the incidence among the whites was about 17 per cent higher than among the negroes.

The youngest patient in this study was colored and 19 years of age. Of the seven patients in the 21 to 25 year period, one was 21 years of age, four 22, one 23, and one 24.

Table VI shows graphically the age incidence. It will be seen that, between the ages of 36 and 50 years inclusive, it is almost uniform, 52.1 per cent of all the cancers occurring in this period.

The line representing the *cure* incidence in relation to age is also very interesting and apparently does not entirely bear out the observations of Slye that the malignancy of tumor growth is greater in young individuals than in old. The absence of any cures between the ages of 19 and 30 is well in accord with these observations. However, in the five-year age period between 31 and 35 we had 43 cases of cancer, an incidence of 11.4 per cent. For this same period we have 8 patients living and well, giving a *cure* incidence of 18.6 per cent, which is higher than that for any other period in this series. This is not because the patients were seen earlier in the disease during this particular age period, for the variations in the duration of symptoms for the various ages is fairly uniform.

In studying the rapidity of the neoplastic growth with reference to the patient's age and the duration of symptoms, we have been unable to note any definite difference or influence which the age might have on the local neoplasm. In studying the time of broad ligament extension or metastasis elsewhere, age was not found to have any definite influence. However, there does appear to be a pretty definite relationship between the age and duration of life after operation in patients who had broad ligament extension or lymph gland metastases. For, of ten patients who lived five years or more after operation before dying of cancer, four had broad ligament involvement, one of them in addition, having metastases to the right external iliac lymph glands. One other patient, fifty-four years of age, had metastases to the iliac glands without histologic broad ligament involvement and lived eight years and nine months before dying of recurrent cancer. Of the four first mentioned patients, all but one were over fifty years of age and lived five, eight and twelve years before dying of recurrence. The one exception was a woman forty years of age who had iliac gland metastases in addition to broad ligament involvement and lived six years before dying of recurrent spinal cell cancer with epithelial pearls.

CLINICAL BROAD LIGAMENT INDURATION AND ITS PATHOLOGIC SIGNIFICANCE

1. *Where cancer has extended into the broad ligament (pericervical) tissues.* In 23.2 per cent of the 120 cases, in which there was broad ligament extension of the cervical cancer, no clinical note as to the presence or absence of broad ligament induration was made. In 52.5 per cent of these cases broad ligament induration was felt on palpation and in 24 per cent it was not detectable, although sought for.

2. *Where no carcinoma has extended into the broad ligament tissues.* In 290 operations broad ligament induration was noted in 31 patients (10.5 per cent) and was found not to signify carcinomatous extension. Induration of the broad ligament region, in cases in which extension of the cancer to the pericervical tissues was debatable, was noted in 4.4 per cent while, on the other hand, in 2.7 per cent of the cases in which the extension was questionable no induration was felt.

To sum up these two groups: In 290 operated cases broad ligament induration was noted 107 times (36.8 per cent). Of the latter in 63 cases (58.8 per cent of 107) the finding signified carcinomatous extension, in 31 cases (28.9 per cent) the finding did not signify cancer and in 13 cases (12.1 per cent) the finding occurred where the extension was debatable.

OPERABILITY

Naturally the question of operability arises, for, although a patient may be subjected to operation, it does not follow necessarily that the case is an operable one, for histologic examination may reveal unsuspected broad ligament extension, which in the light of our experience almost certainly precludes an operative cure and, therefore, makes the case a nonoperative one, or at least one beyond the scope of a permanent cure. Of our 290 patients operated upon, 110 (37.9 per cent) had broad ligament extension, so that our operability in this group is confined to 180 cases or 62.1 per cent of 290.

PRELIMINARY CURRETTAGE AS A FACTOR IN LESSENING THE FREQUENCY OF CURES IN CERVICAL CANCER

The curette, most courted and ill used of gynecologic instruments, has functioned at most operations for carcinoma of the uterine cervix. Until recent years a primary curettage, sometimes and sometimes not followed by local cauterization, preceded every radical operation for this type of cancer. In some instances the curettage was done several days before operation, to remove tissue for diagnosis; in other instances to reduce the size of the primary tumor. In most cases, however, the curettage was followed immediately by the radical operation.

The consensus of opinion, from both the pathologic and surgical standpoint, is against the preliminary excision of tumor tissue for diagnosis, unless one is prepared to proceed immediately with a radical operation in the event malignancy is proven. For, if our experience with cervical cancer is to be similar to that of others with carcinomata elsewhere, particularly those of the female breast, where exploratory operation, if not immediately followed by a radical operation is in the great majority of cases the cause of a fatal ultimate result due to tumor metastases (Bloodgood),* then our ultimate result here should be almost hopeless.

Hence, it was of interest and importance to determine in this study how many of the patients who are living and well today were subjected to a primary curettage of the cervical growth *several days* before the radical operation. Of the living and well patients (cures) in the transitional cell type of cancer 10 patients (50 per cent) underwent a curettage *several days* before the radical operation. In the fat spindle cell group the only living patient (100 per cent), in the spinal cell group two patients out of fourteen (14.2 per cent) and of the adenocarcinomata one out of three (33.3

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* Personal communication.

per cent) were subjected to a similar curettage several days before the operation and are now living and well. In fine, of the 38 patients living and well today, 14 or 36.8 per cent were subjected to a curettage several days before the major procedure. It would seem, therefore, that the dictum, requiring immediate radical operation following the removal of diagnostic tissue in cancer of the breast, does not necessarily apply in the same degree to cancer of the cervix, and we know that it does not hold for carcinoma of the corpus or fundus uteri. It must not be inferred from this that we now practice indiscriminate curettage in cases suspected of cancer. Our custom has long been to examine frozen sections in doubtful cases and, when cancer exists, to proceed immediately with the radical operation. In even fairly outspoken cases where ulceration exists, a small bit of tissue is also removed for diagnosis and in this way an occasional tuberculous or infectious nontuberculous ulceration is detected and the patient saved the ordeal of a radical operation.

TABLE VII.

To show summarily, of the patients operated upon and traced, the number and total incidence per cent of patients living and well under the various cell types.

Predominant cell is bold face type	Total number	Total per cent incidence	No. operated and traced	No. living and well	Per cent frequency of patients operated and traced who are living and well
Spinal and Transitional	39	10.1% of 387	24 (P.8)	12 (P.6)	50% of 24
Spinal	14	3.6% of 387	9 (P.6)	1 (P.1)	11.9% of 9
Spinal, Transitional and Fat Spindle	7	1.8% of 387	3 (P.3)	1 (P.1)	33.3% of 3
Predominant type Spinal; **Total**	50 cases	15.5% of 387	36 cases (P.17)	14 cases (P.8)	38.8% of 36 cases living and well (P.47%)
Transitional and Fat Spindle	63	16.3% of 387	28 (P.1)	3	10.3% of 28
Transitional and Spinal	83	21.4% of 387	42 (P.12)	8 (P.3)	19.0 %of 42
Transitional, Fat Spindle and Spinal	30	7.7% of 387	11 (P.3)	1	9.1% of 11
Transitional	83	21.4% of 387	51 (P.2)	8	15.7% of 51
Predominent type, Transitional; **Total**	259 cases	66.8% of 387	132 cases (P.18)	20 cases (P.3)	15.1% of 132 cases living and well (P.16.6%)
Fat Spindle and Transitional	29	7.4% of 387	15	1	6.6% of 15
Fat Spindle	18	4.6% of 387	6	0	0
Predominant type, Fat Spindle; **Total**	47 cases	12.0% of 387	21 cases	1 case	4.76% of 21 cases living and well
ADENOCARCINOMA	21	5.4% of 387	14	3	21.4% of 14
Grand Total	387 cases	99.7% (100%)	203 cases	38 cases	18.7% living and well

KEY: P—Indicates cases with epithelial pearls.

FINAL RESULTS IN PATIENTS LIVING AND WELL TODAY

Of the 203 patients that were operated on and in whom the ultimate result is known, *thirty-eight** (18.7 per cent) are living and well today. The relation of the cured cases to the type of cancer cell predominating in the cervical neoplasm is the point of interest here.

From Table VII, which gives the distribution of the patients who are now living and well, it will be seen that of the cases in the group where the *spinal* cell is the predominant type of cancer cell, 38.8 per cent of the patients are living and well. In the *transitional* group 15.1 per cent are living and well, while in the fat spindle cell group the percentage is 4.76. The adenocarcinomas, while showing the smallest percentage incidence of all the cervical cancers, give a 21.4 percentage of apparent cures, which is next those in the spinal cell variety of epidermoid cancer.

Although the results of this study are entirely different from what we had anticipated on the basis of our preconceived hypothesis, nevertheless we feel that the findings are strongly indicative that the histologic character of the predominant type of cancer cell in cervical epidermoid carcinoma is a good index as to the relative malignancy of the neoplastic process. This is distinctly at variance with the findings of Liegner who, as previously mentioned, from a study of thirty cases concludes that one cannot determine the malignancy of cervical cancer from its histologic appearance. Other investigators, especially Broders, studying epidermoid cancer in other situations, find that the appearance of cancer cells is a good index as to the relative malignancy of an epidermoid neoplasm. The findings of Broders for these neoplasms in other situations is very much in accord with our ultimate results for cancer of the cervix, in that he also concludes that cancers composed of cells having more or less the appearance of the normal cells seen in the prickle cell layer of the skin (fig. 2· *a*) have a high percentage of cure. In fact, for cancer of the lip, Broders reports 100 per cent cures when the cancers were, as he designates them, of the "Grade I" type, which corresponds probably to what we have designated as *spinal cell* cancer.

SUMMARY

1. The cells seen in epidermoid cancer of the cervix fall morphologically into three large groups: transitional, fat spindle and spinal cell groups.

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* This includes two cases that were not operated upon, being treated by radium in one instance and by the Percy cautery method plus radium in another.

2 Secondary involvement of the corpus uteri in cervical cancer occurred in 41.3 per cent of the cases in which the entire length of the cervix was involved.

3. One-third of all the patients seen during the first six months of symptomatic disease, with the exception of those suffering from the spinal cell type of cancer, had extension of the neoplastic process to the broad ligament.

4. Less than 10 per cent of the patients with broad ligament involvement lived more than one year after operation.

5. The first symptom of disease in almost 85 per cent of the cases studied was some form of unusual vaginal bleeding. In 97 per cent some form of unusual vaginal discharge (either bleeding or leucorrhea) was the primary symptom.

6. Of all the cancers in this series 52.1 per cent occurred between the ages of 36 and 50 years inclusive.

7. Of the patients between 31 and 35 years inclusive, 18.6 per cent are living and well today. This is the highest "cure" incidence for any five-year age-period in this study.

8. Of these patients 5.4 gave a history denying pregnancy at any time or any form of vaginal instrumentation.

9. In 58.8 per cent of the patients operated upon, where broad ligament induration was noted on physical examination, this finding signified carcinomatous extension.

10. The total operability of the cases in this study is 46.5 per cent.

11. The total operative mortality in this series is 14.2 per cent. The operative mortality prevailing in this clinic at the present time is between six and seven per cent.

12. Preliminary curettage performed several days prior to the radical operation for cancer was the procedure employed in 36.8 per cent of the patients who are now living and in good health. From this we would conclude that a diagnostic curettage not immediately followed by a radical operation for extirpation of the malignant process does not by any means render the prognosis hopeless.

13. The incidence of patients operated upon and traced who are living and well today is 18.7 per cent.

14. The incidence of so-called "five year cures" is 26.6 per cent.

15. In this study we have encountered no epidermoid cancer of the cervix which conforms to basal cell cancer of the skin in regard to its apparent lack of malignancy.

16. The histomorphology of the predominant types of cells in epidermoid cancer of the cervix is important, in that it indicates the relative malignancy of a given tumor. In this study the *spinal* cell type of cancer proved to be the least malignant. The *transitional* cell type is next in order of increasing malignancy and the *fat spindle* cell type of cancer has proven to be most malignant of all.

17. The adenocarcinomata, as far as relative malignancy is concerned, fall in between the spinal cell and transitional cell groups of epidermoid cancer.

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RECENT MECHANICAL INJURIES TO THE EYES

THEIR EXAMINATION AND MANAGEMENT[*]

EDWARD JACKSON, M.D.
DENVER, COLO.

Ocular injury is commonly an emergency condition, to be examined and treated by the first physician that can be reached. Among mechanical injuries contusions often fail to receive the serious attention they deserve.

CONTUSIONS

A contusion can do any amount of damage to the eye, from momentary blurring of sight to complete, permanent blindness; and contusions can be inflicted by all sorts of missles. A pin or a bullet, a fist or an explosion may cause contusion. The injury may cause no external lesion, or it may rupture and empty the globe. A case is on record, in which a blow from a cow's horn expelled a ripe cataract from one eye and later the same accident with a like result occurred to the other eye.

The ecchymosis left by a contusion is characteristic and certain to be noticed, but it may not appear for several days. A blow fracturing the orbit may cause no discoloration, until dissolving blood makes its way from its deep origin to the margin of the orbit, or the skin just within the bony margin. Such a blow may cause complete blindness by laceration of the optic nerve, or pressure upon it by hemorrhage. Such blindness shows no evidence externally, and at first none to the ophthalmoscope. It shows at first only loss of pupil reactions, to light thrown on that eye. Only after several weeks does the resulting atrophy of the optic nerve become evident through whiteness of the optic disk.

Within the eyeball, paralysis of the sphincter of the iris or of the ciliary muscle may be complete and permanent, or transient and only partial. The pupil may be distorted by partial paralysis of the iris. The vision may be greatly blurred by mere paralysis of accommodation. Partial or complete dislocation of the crystalline lens occurs rather frequently, with perhaps only a little distortion or displacement of the pupil, or alteration of the depth of parts of the anterior chamber. The sclera may be ruptured and the lens escape under the conjunctiva, without a drop of blood escaping on the surface of the eye. The vitreous may be filled with hemorrhage, the iris or choroid may be ruptured, the iris detached and even forced out under the conjunctiva, or the retina detached, without anything showing externally to indicate the complete and sometimes lasting blindness that has been caused in an instant.

During the great war, it was found that all sorts of missiles, striking the eye and leaving no external wound, passing through the orbit and not touching the eyeball or the optic nerve, shattering the walls of the orbit without touching any of its soft parts, even air concussion, leaving no visible mark on any part of the body, could cause most serious bruising of the delicate contents of the eyeball, so as to produce most serious loss of vision. Such injuries were most likely to cause hemorrhage and subsequent chorioretinitis at the posterior pole of the eye, destroying vision at the macula, the most sensitive and most important part of the retina, and only to be observed with the ophthalmoscope. I have seen the bursting of a cream separator cause contusion of the eye, simply by the milk contained in it being hurled against the eye by centrifugal force; and this contusion was followed by a long attack of uveitis that left the sight somewhat damaged permanently. Without rupture of the lens capsule contusion may cause cataract; or through partial dislocation of the lens cause glaucoma.

This long series of possible catastrophes has been recited to bring out the need to examine the eye, which shows no evident damage by contusion, in many special ways, so as to develop evidence of the damage done and its exact character. If the physician who first sees the case cannot command them all in the emergency, he should use all that he can; and he should realize that, by some method not then available, essential evidence of the nature and effects of the injury may be revealed.

The inspection must include every detail, especially as regards the pupil and its reactions; and the anterior chamber, its depth at different parts, its contents, particularly blood, the steadiness of the iris, or its tremulousness where it has lost the contact and support of the lens. Any physician who happens to have his hand with him and his wits about him can test the reaction of the pupil to light. He should also be able with his finger tips to test approximately the tension of the eyeball. Even if he has had little practice he can compare the tension of the injured with that of the uninjured eye, or with that of his own eye or the eye of some bystander. Lowered tension indicates rupture of the sclerocorneal coat. Of course any refinements of inspection that are available should be used. The cross light or focussed light in a dark room, a magnifying lens, inspection under different conditions of lighting from different directions, with the eye turned in different directions, should all be tried.

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The emergency treatment for contusion of the eye must vary with the exact lesions caused, but certain things are indicated and available that may be used in many cases. For ecchymosis the escape of blood into the tissues is first to be checked by pressure and cold locally, and rest with the head high. These measures may be resorted to, even when bleeding is only suspected and has not appeared on the surface. The rest with the head high is indicated for intraocular bleeding, and atropin may be used to promote intraocular quiet. Care in its use must be recognized as important a few days later, when glaucoma may arise. Later the absorption of effused blood may be favored by application of heat or massage of the parts, or the dilated pupil brought down by eserin. When contusion has burst the sclerocorneal coat, with or without rupture of the conjunctiva, the treatment required is more that of a penetrating wound of the eyeball and may be alluded to under that heading. The possibility of endogenous infection complicating contusions should not be forgotten.

PENETRATING AND LACERATED WOUNDS OF THE EYEBALL

The eyeball may suffer a penetrating wound from many things and in many ways, with or without the patient being conscious of what has happened. Immediately after the injury the softening of the eyeball by escape of intraocular fluid is very suggestive, but a small perforation may close so quickly that the normal intraocular tension will be practically restored within an hour or two. Bleeding is the common symptom to direct attention to a penetrating wound. But such wounds in the cornea and crystalline lens cause no bleeding; and small amounts of blood may be washed from the conjunctiva without having been noticed, while bleeding in the deeper parts of the eye may not be recognized except with the ophthalmoscope. Nature has provided for the rapid closure of penetrating wounds of the eyeball, and it is astonishing how quickly such closure may conceal their presence.

Sometimes, although the external coats of the eye show no sign of a scar, the occurrence of deeper changes may demonstrate that the injury has penetrated the eye. Sometimes the penetrating injury may be concealed by the lids. It must be remembered that there may be more than one lacerated wound of the eyeball from the same accident. A birdshot may go in one opening and out another. The thorough inspection of the eye as soon as possible after injury should include noting evidence of former lesions. An old scar may have been present, as a nebula of the cornea, which it was perfectly evident was old at the time of this injury, but a few days later it might be taken as evidence of recent injury, overlooked at first inspection. Remember that ocular injuries are not merely cases for treatment; they are a basis for claims and lawsuits.

It is very important to investigate all the circumstances of the accident, while they are fresh in mind. What was the nature of the missile that struck the eye? Was it the end of a piece of wire, or a small chip of steel or copper? If the fragment of metal cannot be found, perhaps inspection of the edge of the cold chisel or the head of the hammer used will show the place from which it came. If it was a piece of wood that gave the blow, perhaps there was a projecting nail or splinter that inflicted the perforation or laceration of the eyeball. Inspection of it will give a better idea of the exact character and extent of the injury. Try to get the most exact account of what direction the missile was coming when it struck the eye. To do this have the patient show just how he was standing or bending, and as nearly as possible where he was looking, in what direction and from how far away did the missile come. In a long corneal cut the length of the wound on each side of the perforation may show the direction from which the offending fragment came, and whether it probably entered through the perforation or passed on externally. Every detail may prove important, if the examiner's mind is alert, and no two injuries are exactly alike.

Now for the management of these cases. They need rest of the parts as much as any injuries. Atropin is the splint for the interior of the eyeball. It puts iris and ciliary muscle at rest. It gives relaxation that may be compared to general anesthesia for the adjustment of a fractured femur. Glaucoma is possible after eye injuries, but not while there is an opening in the eye, through which fluid is freely draining. It must be more frequently applied when fluid is draining rapidly out of an opening in the eyeball, than when it is not being carried off in that way.

Thorough cleansing of the wound and removal of all devitalized or infected shreds of tissue is called for in these cases. The strong outflow of lymph and blood from a lacerated wound of the eye will carry off many minute particles of foreign substance, will expel many thousands of invading bacteria and many particles of possible nidus favorable to their multiplication, but every visible particle should be removed. Iris, ciliary body, lens debris, prolapsed vitreous should all be thoroughly removed from the wound, with gentleness and despatch that will guard against still further prolapse and the need to remove more tissue. Blood of itself is not dangerous, but if it carries or conceals something else it should be gotten rid of. There will always be enough bacteria left in the wound for antibodies and phagocytes to take care of, and reduce the number of invaders as much as possible.

The first dressing for most penetrating and especially lacerated wounds of the eyeball is the conjunctival flap. It is a temporary structure that goes back into normal position without any special care about replacement, without even removal of the sutures that held it in position, until its protective function is performed. It is highly vascular, seals up the wound and in every way favors early repair, then quickly gets out of the way. In forming the flap the greater part of the bulbar conjunctiva is so loosely attached to the underlying structures that it can be drawn over to almost any desired extent. But at the limbus it is firmly attached. So the limbus must be carefully undermined quite beyond the part it is necessary to cover. Even to cover a small wound near the margin of the cornea it may be best to divide and undermine the conjunctiva half way around the corneal margin. For more extensive wounds there need be no hesitation about doing this all the way around the cornea, and bringing the two conjunctival flaps together across the cornea and suturing to hold them in that position. They can often be held close enough together by stitches placed either side of the cornea. If a stitch has to be placed in front of the cornea, it should be watched, should be of soft material, and often it may be cut at the end of twenty-four hours.

Rest is as necessary for the repair of these wounds as any others. For large wounds it is only attainable by preventing the movements of the eyeball. This is secured by keeping both eyes closed under dressings. This may be only needed for one or two days, but the eyes so constantly move together that the injured eye can only be kept still by closing both. The dressing should be light, generally as light as possible. A little absorbent cotton held in place by a strip of adhesive plaster is better than a more elaborate shield or a roller bandage. Pressure made by a bandage is a two edged sword, more apt to do harm when the eye is slightly shifted than the good it was intended to do when accurately adjusted. When a wound is so small that it does not require the eye to be fixed, a light dressing over the one eye is indicated for the first day or two to guard against infection. Few wounds of the eyeball require to be sutured. The eye should be carefully adjusted and observed to see whether the parts tend to remain in proper apposition. If a stitch is needed, put it in the conjunctiva and subconjunctival tissue, or use a conjunctival flap, if possible.

FOREIGN BODIES IN THE EYEBALL

Do not *guess* about their presence or absence; *know*, if that is humanly possible, and it generally is. The common mistake is to assume a foreign body is not in the eye when really it is there. Patients often say with great confidence there is no foreign body in the eye because they do not feel the familiar irritation and scratching, caused by a particle of dust or grain of sand lodged on the conjunctiva. Of course, if a foreign body is buried in the tissues, even if it is only sunk in the cornea deep enough not to project and scratch the lids, the familiar "feeling of a foreign body in the eye" is absent. It may be absent, even when foreign bodies are in the conjunctiva buried between the transition folds. On the other hand, if there is congestion, enlargement of the conjunctival veins and slight roughening of the lids, without anything like a foreign body present, the familiar sensation of dust in the eye is felt, and it is hard to convince some patients that it is not from that cause.

If the outer coats of the eye have been penetrated, the presence of a foreign body should be at once thought of, and everything done to ascertain whether it is or is not present and if present its exact location. The details to be inquired into with reference to all penetrating wounds of the eye become doubly important, if a foreign body is present. The wound of entrance must be carefully searched for, if lowered tension of the eyeball indicates that one is present. When perforation is found, the condition of structures within the eye will throw the most light on the subject. Even with the smallest wound in the cornea or sclera, if there is also a hole at a corresponding point in the iris, or a speck of opacity in the lens, it must be supposed that a small foreign body has entered the eye and probably remains there.

Inspection of the anterior parts of the eye with careful focal illumination and a magnifying glass is imperative, and the deeper structures of the eye should be searched with the ophthalmoscope. The ophthalmoscope with a strong convex lens behind the sight hole (+15. D or upward) will reveal a very small foreign body in the clear media of the eye, looking like a black speck against the red of the eye ground. If there has been no bleeding to prevent it, careful search with the ophthalmoscope will reveal a foreign body and its location in a large part of the eyeball. But it must be remembered that there is a good deal of the eyeball, from the equator forward, that cannot be seen with the opthalmoscope ordinarily. Parts of this region can be brought into view by pressure on the ciliary zone, but a foreign body may readily escape detection in this region.

Even the angle of the anterior chamber cannot be seen, except by a special method of examination through a "contact glass." I once extracted a birdshot from this locality. It would roll into the angle of the anterior chamber, behind the scleral margin and get entirely out of sight. A good deal of "fishing" for it had to be done before it could be caught with a small wire-loop, and coaxed to the opening in the anterior chamber that had been made for its removal.

But the real search for a foreign body in the eyeball is to be made with the x-ray shadow on a sensitive film. There are some substances that will not cast a shadow with the x-ray, but they do not often get into the eye. Particles may also be so small that the x-ray will not show them. But very rarely do such small particles strike the eye with sufficient force to make them penetrate its coats. In general, if a particle strikes the eye with enough momentum to pass through the sclerocorneal coat, it will be large enough to cast a noticeable shadow on the film, if the eye is kept perfectly still during the exposure. That is the thing which makes the x-ray film reliable. If the surgeon will be present when the x-ray exposure is taken, and will watch the eye closely for any movement, he can judge better of the reliability of the result as to the showing of small foreign bodies.

An x-ray exposure, or more than one, should be taken in pretty nearly every case in which there is reason to suspect the presence of a foreign body in the eye. Even if a foreign body is perfectly evident to ordinary inspection or with the ophthalmoscope, there may be more than one present, and it is important to remove them all. More than one foreign body may enter through a single wound of entrance, or a second opening in the coats may be supposed to be a wound of entrance, and really be a wound of exit and no foreign body at all remain in the eye.

A modification of the x-ray exposure that is sometimes of great value for showing minute foreign bodies is the very short exposure that is needed to get the shadows of soft tissues and other substances that are nearly transparent to the x-ray. The ordinary exposure is made for a time and to a quality of ray that can pierce the dense bony walls of the orbit, and will also pierce some of the foreign bodies that might be lodged in the eye. But more than half the eyeball is located in front of the outer edge of the orbit. It is the part of the globe that foreign bodies are most likely to be lodged in, the part in which they are least accessible to ophthalmoscopic detection and the smaller foreign bodies are most likely to be revealed by such a short exposure. Then the exposure that shows the shadows of the soft parts of the eyeball and lids, with that of the foreign body, gives a very good idea of the location of the latter, even without special apparatus for localization. Such short exposure should be taken as part of a complete x-ray examination of any of these cases.

But it is always worth while to know all you can about every case you have to treat. The exact x-ray localization of every foreign body entering the eye should be made, if possible. The sideroscopic examination is inferior as to its location. The giant magnet may bring a bit of steel out of the eye, even though its exact location is not known, but with an added risk that should not be incurred if it can be avoided. For foreign bodies that are not attracted by the magnet, the chance of extracting them depends entirely upon knowing exactly their size and location.

A foreign body in the eye is always important enough to be searched for in every way possible. Even a foreign body in the cornea should be looked for with the light from a broad surface and from a single point, condensed on the surface or behind the cornea, thrown in from different angles, and with the ophthalmoscope used from all directions, with staining of the corneal injury to throw out the foreign body in contrast; and the careful prolonged examination with the opthalmoscope from every angle. Justice is not done the patient without adequate application to all the possibilities of his case of the present resources of medical and surgical art.

Any foreign body in the eyeball should be removed as soon as possible. There are conditions under which a departure from this rule may be considered, but they arise rarely and only large experience and careful consideration of the extraordinary conditions can justify such a departure. I once saw a foreign body that had been lying on the cornea four months without causing symptoms. It was a small, smooth, almost flat, vegetable scale lying near the limbus. But its removal showed it was entirely on the surface of the epithelium and not in the least imbedded. One foreign body, that had been there for eighteen months, lay embedded in masses of proliferated epithelium, but with no part of the foreign body projecting to cause scraping of the lids. A piece of corn leaf, embedded in granulation tissue at the limbus that looked like pterygium, had been in the eye for seven weeks.

No matter how long it remains, a foreign body in the cornea will cause symptoms until it is removed. In deeper parts of the eye some foreign bodies remain long periods without causing symptoms. But nearly all of them do some time. The insidious changes of siderosis may cause permanent loss of sight, while those of sympathetic ophthalmitis destroy also the sight of the other eye. The sooner a foreign body can be removed the better; a single day may mean the difference between useful vision restored and permanent blindness.

WOUNDS OF THE LID AND ORBIT

Mechanical injury of the eye lids is commonly perfectly evident and it matters little how it has occurred or what has become of the body that caused it. The questions that arise are what is the exact character of the injury, and how can the most perfect restoration possible be brought about. Lids and eyeball may be injured together and then the questions belonging to perforation of the globe must be considered.

Unusual Bile Duct Visualization by Roentgenograms of Barium Meal. Edwin Haabe, Boston, and Lester A. Smith, Indianapolis (*Journal A. M. A.*, Feb. 13, 1926), report a case in which the intrahepatic bile ducts were filled by the barium meal, evidently through a spontaneous cholecystoduodenostomy, and were clearly visualized. It is suggested that the bile ducts are probably filled in a similar manner by duodenal contents, after meals, particularyl when the patient lies down after eating. The retention of the barium in the ducts indicates that food material, with its accompanying bacterial content, must be present in the bile ducts at all times.

LYMPHATIC CYSTS OF THE NECK WITH THE REPORT OF A CASE

Eldred B. Waffle, M.D.
and
Frank E. Fowler, M.D.
ASTORIA, ORE.

Cysts of the neck occurring in infancy and childhood are fairly common, yet not so much so that cases arising in one's practice do not arouse unusual interest, particularly when they are the so-called lymphatic cysts (lymphocele) or hygroma cysticum colli. The diagnosis of the exact nature of these cysts is uncertain and factors of origin are always debatable. Similarly does the therapy bring forth many ideas. It is for these reasons that this paper is presented with a review of a recent case treated by us.

1. G. Age 5 years. Normal birth, breast-fed baby. Family and past history negative.

When the child was two years old the parents noticed a swelling on the left side of her neck, which became larger when she laughed or cried. (fig. 1.) This has increased gradually in size during the past three years. It causes no pain whatsoever. Physical examination reveals a well developed and nourished child of five years. There are no remarkable findings, except for a soft cystic swelling on the left side of the neck just anterior to the sternomastoid. The swelling is about twelve cm. in length and increases one-half again in size when the child laughs or cries. It is not tender, red or hot and not freely movable. There is no demonstrable communication with the nasopharynx.

Operation April 20, 1925. Excision of cyst of neck. A three-inch curved incision was made midway between clavicle and mandible, anterior to sternomastoid. Beneath the cervical fascia a bluish, thin-walled cyst was exposed. This extended upwards to the mandible and down to the clavicle, where it seemed to arise in a large lymph node. It lay upon the great vessels of the neck. By careful, sharp, and blunt dissection the cyst was freed, although ruptured in the process, and clear yellowish fluid escaped. It was removed by transfixion of the base. It was about 12 cm. by 7 cm. in size (fig. 2). Wound was closed in layers about one small rubber tube drain with Michel clips to the skin.

The fact that the cyst appeared to increase in size when the child laughed or cried can be explained by the forcing upwards during deep inspiration of the muscles and Sibson's fascia upon which structures the cyst rested.

Note: Wound healed per primam and now, nine months postoperative, there is no sign of recurrence and the child is in excellent health (fig. 3).

Pathologic Report: By Dr. M. Holmes, of St. Mary's Hospital. Specimen consists of a collapsed, thin-walled sac 12 by 7 cm. in size. Scattered in the walls are numerous smooth elevated plaques.

Microscopic Examination: Sections of the wall reveal a typical lining layer of endothelial cells, with areas of lymphatic infiltration. This report was confirmed by Drs. A. C. Broders and H. D. Caylor of the Laboratory of Surgical Pathology of the Mayo Clinic.

Considerable confusion as to the classification of the growths occurring in this region in infancy and childhood exists and it seems to us that the one

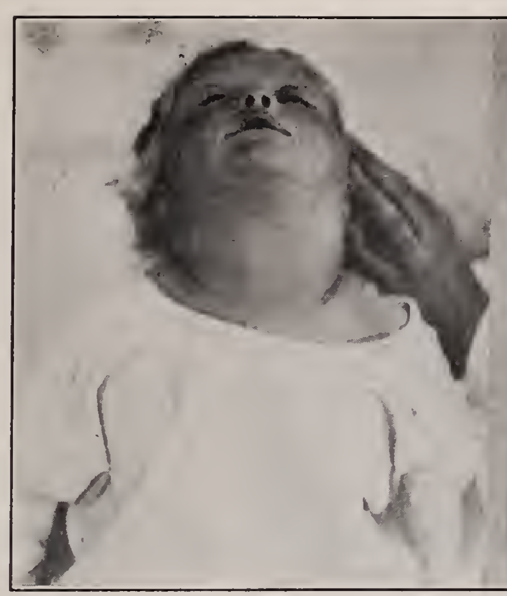

Fig. 1. Immediately after operation.

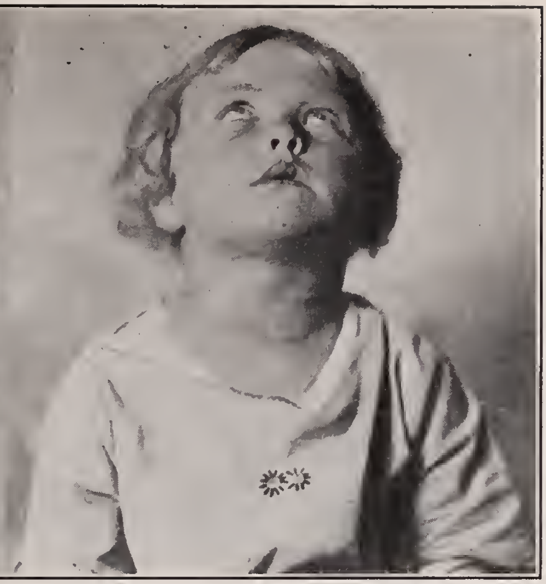

Fig. 3. Ten days after operation.

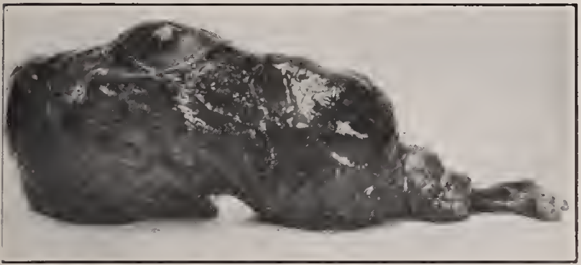

Fig. 2. Cyst removed. About one-third actual size.

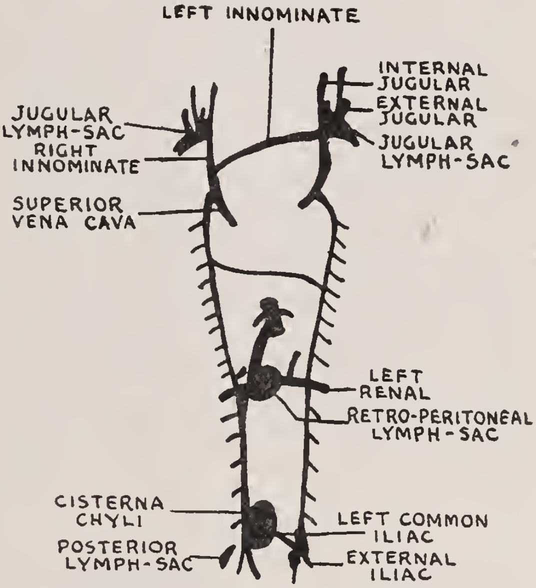

Fig. 4. Schematic drawing from Gray's Anatomy, showing relative position of primary lymph sac, based on the description given by Florence Sabin.

suggested by Thompson[1] is most satisfactory and should be generally adopted. It is as follows: (1) Lymphatic cysts, (2) thyroglossal cysts, (3) branchiogenetic cysts, (4) sequestration dermoids, (5) thyroid gland cysts, (6) parasitic cysts, as echinococcus. To this we cannot refrain from adding inflammatory processes with cyst formation, including the rare bursal cysts which occasionally occur in the midline. Instantly the first four of these stand out as of accepted congenital origin and the causative factor in all is obviously some embryologic accident, but it is not our purpose here to dwell on any other than the lymphatic type. The lymphatic system has its origin as a series of lymph sacs at the points of union of certain embryonic veins. These sacs are formed by the confluence of numerous venous capillaries which lose their connections with the venous system but later, with the formation of the lymph sacs, regain them. Therefore, the lymph system is developmentally an offshoot of the venous system and the lining wall of its vessels is always endothelium.

There are six of these lymph sacs formed in the hmuan embryo (fig. 4), two jugular in the neck, two posterior lymph sacs in the iliac region, one retroperitoneal sac and the cysterna chyli. From these lymph sacs the lymphatic vessels bud out along fixed lines, corresponding more or less closely to the course of the blood vessels. Thus are the lymphatic capillary plexuxes formed. Anastomoses are numerous and blind ends and culdesacs are common, particularly in the intestinal villi and the dermal papilli.

With this knowledge of the development of the lymphatic system the origin of these cysts is apparent. Whether one wishes to attribute the tumor to a sequestration or to imperfect development is in a way optional. It seems to us, however, that the most logical view is to assume it to be the product of a budding lymph vessel which ended blindly, yet of sufficient calibre to develop its endothelium to secretory activity. The occurrence and early development of these cysts, practically all reported cases being under one year, also points to a developmental error rather than a sequestration, since it is well established that the growths accepted as having the latter origin most commonly become evident as adult life is reached.

The rich lymphatic supply in the neck readily explains the more common occurrence of the growths here. The next site is the axilla, where there is also a rich lymphatic supply. Peculiarly the groin does not produce so many, yet there are enough occurring here to establish their existence.

The striking features about this case, which led us to believe that the origin lay in a closed-off budding lymph vessel, was the fact that, as the cyst was exposed and the dissection carried downward beneath the clavicle and upon the great vessels, the cyst definitely arose from an enlarged lymph node. How sequestrations could be so connected with the lymphatic systems is not apparent to us.

Dowd,[2] in 1913, gave an excellent summing up of the condition in which he reports four cases of his own. In this report Farr gives well prepared tables of all the reported cases at that time, which totaled 122, ninety-one being in the neck and thirty-one in the axilla. Dowd's cases all were multiocular cysts, while ours was a single cyst, but of the endothelial lining which is characteristic of these cysts, there is uniformity. Other cases have been reported by Smith[3] and Ellis.[4]

CONCLUSIONS

1. Lymphatic cysts or hygroma cysticum colli are the result of imperfect development in the lymphatic system, rather than of embrologic sequestrations.

2. Complete excision is the best and most satisfactory form of treatment.

3. A simple concise classification should be adopted to cover all such tumors occurring in infancy and childhood. The one herein copied is suggested.

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VON RECKLINGHAUSEN'S DISEASE OR NEUROFIBROMATOSIS*

Morris L. Bridgeman, M.D.

PORTLAND, ORE.

Report of a Case from Department of Pediatrics and Pathology, University of Oregon Medical School

P. O., a male, 13 years of age, an adopted child, reported to the Portland Free Dispensary Nov. 21, 1923, with the following complaints:

1. That he tires easily.

2. That he perspires profusely at night, especially when he has a cold or has become tired. These attacks may occur as often as two or three times a week.

3. That he is nervous, has difficulty in going to sleep and may lie awake for hours, but in the morning he is very difficult to awaken.

4. That there are enlargements in the right cheek and several in the arms, a few in the scalp and on the forehead. The enlargements of the cheek were first noticed when he was adopted from the children's home at the age of three years. The cheek was noticeably enlarged and there were a few small kernels palpable within. The cheek since has been becoming progressively larger. About two years ago, in rubbing him for an attack of rheumatism, there were noticed several enlargements in the arms and a few on the forehead.

The family history cannot be obtained.

He had smallpox and chickenpox while in the baby home. There is a question as to whether he had an attack of infantile paralysis. He had scarlet fever at the age of ten years and for the past two years has had sharp shooting pains in the legs and about the ankles. There is a history of an injury to the right jaw by a fall from a bicycle. There is no history of operations.

The cardiovascular reveals the history of recurring headaches, which began at the age of eight years, located in the frontal region, but later becoming localized above the left eye. These headaches were incurred by any excitement such as a circus, or were brought on by attacks of indigestion. The headaches are not as frequent at present nor of such an intensity. There are no complaints relative to the heart. Respiration is normal. The genitourinary and gastrointestinal complaints are negative.

He is found to be of a pleasant and extremely amiable disposition. He takes pleasure in the outside activities such as hiking, and enjoys wrestling with his ten year old companion. He does not care for candy and his appetite is very precarious and limited. His family states that he is very nervous, so much so that he will tear his hat or cap into bits while watching a movie. It was stated that he is very forgetful. When he is sent on errands he is very likely to bring back the wrong article. He has lost his clothing, such as coats, hats and rubbers, on numerous occasions. He entered school at the age of six years and passed the first grade. He failed to pass the second grade, but was passed the following year on trial into the third grade. He is now in the fifth. His most difficult study is arithmetic but he has been allowed to go along with his class, having discontinued this subject.

He is 55 inches in height and weighs 66 pounds. There is no change in the hair of the head. The pupils of the eyes react to light and distance. There is a slight hippus to both pupils when exposed to the flashlight. The conjunctiva is pale and without evidence of jaundice. The eyegrounds are normal appearing. The optic disks appear to be unchanged. The vision of the right eye is 20/30 and that of the left is 20/25. There is a decreased ability to hear with the right ear as compared with the left. The right lower jaw shows an absence of the first premolar, second premolar and first molar, whereas the second molar is just protruding.

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* Read before a Meeting of Northwest Pediatric Society, Portland, Ore.

The rest of the teeth are present. The tonsils are large and slightly hyperemic. There is no pussy exudate. The parotid gland is secreting on both sides. The neck is negative. The pulse is full, regular, and 60 to 70 in rate. The lungs and heart are negative. The heart borders are within normal limits. The abdomen is negative. The liver falls only a short distance below the costal margin. The spleen is not palpable. The genetalia are those of an infant. There is no evidence of pubic hair. The testes are small and lie within the scrotum. There is a slight scoliosis of the sixth and seventh dorsal vertebrae to the right.

The patient is able to taste, smell, hear and see. There is no difficulty in deglutition. The forehead wrinkles symmetrically. The squint is bilateral symmetrical. The eyes react to light and distance and the pupils are equal in size. The tongue is protruded in the midline. The palatal reflex is obtained and is symmetrical. The bite is obtained on both sides. The jaw reflex is obtained. The smile bilaterally symmetrical. The triceps, biceps and periosteal radial reflex are obtained. The abdominal reflexes are active. The scrotal reflex is present. There is no difficulty in passing of urine or fecal material. The naval reflex is active. Ankle clonus is absent and the Babinski is negative.

The right cheek contains eight rather firm discrete, movable, painless tumor masses about the size of an almond, situated over the anterior portion of the zygoma and distributing laterally and inferiorly. They are not attached to the skin. There is no evidence of hypermia. Over the angle of the jaw there is a similar mass about the size of a quarter, which is flat and is similarly movable. The scalp contains eight pea-size masses; there are several in the posterior cervical region and there are many in the supraclavicular region which are smaller than a pea. On the chest anteriorly within the region of the sternum there are no masses found. Near the region of the left nipple there is one; near the right nipple there are four. There are about four small ones on the back. The abdomen reveals none. On the right forearm there are sixteen palpable masses which are on the flexor surface and follow along the course of the median and ulnar nerves. In the right arm on the flexor surface there are about twelve, and extending into the axilla there are numerous ones found along the course of the nerves. In the left forearm there are twelve tumors similarly arranged as in the right forearm. In the left arm there are about twenty and in the axilla about twelve. In each groin there are around sixteen palpable masses. On the lateral portion of the left thigh there are sixteen palpable masses. On the lateral portion of the right there are eight. On the medial surface of the left thigh there are two; on the right there is one almond size and three smaller. There are numerous small ones in the popliteal spaces. Three are found over the surface of the left shin and two on the right. In both calves there are about twenty from the sixth of an almond down. In all there are over 260 countable masses but there are undoubtedly many more which are too small for palpation.

There is a general diffuse freckling more marked over the body, the arms, forearms, hips, nose and neck. This freckling is only slightly over the legs and thighs. There are also areas of pigmentation, one patch the size of a quarter over the left inguinal region which has the appearance, as described by the French as "cafe au lait." There is a patch the size of a half dollar over the substernal region. There are three patches the size of a half dollar distributed on the back. These patches are brownish, unraised, nonhyperemic and lie independent of the growths.

The blood taken on three days shows a low red blood cell count; 2,900,000; 3,200,000; 3,000,000. The white blood cell count is 5,500; 5,000; 6,500. The polymorphonuclears are 42 and 37 per cent; the small lymphocytes 34 and 43 per cent; the large lymphocytes are 22 and 10 per cent. The color index is 1.05. The hemoglobin by talquist is 60 per cent. The Wassermann is negative for parasites in two samples. The urine shows no changes.

A fluoroscopic examination shows a peribronchial thickening which is more marked on the right than on the left. The heart boundaries are within normal limits. The diaphragmatic excursion is good. An x-ray of the right lower jaw shows that there is one impacted molar but that the rest of the teeth which have not appeared are present and are unobstructed.

A specimen was removed by a small incision from the angle of the scapula. It was found to lie within the fatty tissue subcutaneously and was not attached to the surrounding tissue, though apparently attached by one end. When removed it is found to be bean shaped and to be slightly nodular. It measured 2 cm. in length and 0.5 cm. in diameter. It is of a greyish white, translucent appearance. A hematoxylin eosin stain shows a reticulum of connective tissue. The tissue is edematous in nature, running in all directions. There are bundles of white fibrous connective tissue and embryonic connective tissue. The vascularity is increased and the blood vessels appear to be engorged. Scattered throughout the section there are many mononuclears. The Mallory reticulum stain shows the presence of the connective tissue but no elastic fibres. Van Gieson's stain shows no differentiation outside of the fact that there is a bundle of fibres running through the stroma, with the appearance similar to that of a nerve fibre which is not enclosed in myelin sheaths. One is not able to state that it is not a nerve fibre, though it is more suggestive of a bundle of white fibrous connective tissue.

CONCLUSION

We have an undeveloped child both mentally and physically with:

1. Progressively growing numerous swellings or tumors, apparently present from birth, some soft and elastic, some firm and tough varying in size from a millet seed to that of an almond, distributed along the course of the ulnar, radial and sciatic nerves, over the chest, back, head and buttocks.
2. Brownish freckles and pigmentation.
3. Scoliosis.
4. Retarded sexual characteristics.
5. Retarded mentality.
6. Headache.
7. Nervousness, rheumatism, night sweats.

CARCINOMA OF THE STOMACH IN A MAN OF TWENTY-TWO YEARS*

HARRY H. KRETZLER, M.D.
EDMONDS, WASH.

Carcinoma in the young is a rare occurrence which makes this case of some interest.

M. B., male, single, 22, fisherman, was first seen by me Nov. 3, 1925. He had been sick for four months. His ailment started with a pain in the right side of his back just below his ribs. This lasted for a week. Shortly after this he became "yellowish," and was unable to work because of increasing weakness. Ten days prior to my seeing him he began to have difficulty in eating. He had a sense of fullness in his abdomen and vomited irregularly. He vomited red blood at times but no coffee ground vomitus. There was no nausea and vomiting relieved him. During this time he also developed a dry irritating cough, which led him to believe that he was suffering from tuberculosis. He had dyspnea on exertion with a sense of weakness and suffocation. He had lost some weight.

On physical examination he was a cadaverous looking man, deeply jaundiced and with a marked abdominal enlargement. His abdomen was more or less uniformly enlarged and was rigid throughout. The liver was enlarged to seven centimeters below the costal margin. There was no dullness in the flanks. The heart was normal in size and shape. The first sound at the pulmonic area was entirely replaced by a murmur which was also heard at Erb's point. The heart murmur was found to be transmitted to the brachial and femoral arteries, giving a positive Duroziez sign. There was present a typical "water hammer" pulse. The lungs were clear with no evidence of bronchitis or tuberculosis. Temperature was 98.8°, pulse 100, respiration 18. The urine was bile stained, specific gravity 1032 and negative for sugar and albumin. The white count was 10,100 with 45 per cent hemoglobin by the Tallquist scale.

Further laboratory work was done a week later. X-ray disclosed a huge aorta almost as wide as the heart. There was a general fibrosis throughout the entire lungs. The stomach was very low but filled perfectly with the barium mixture. The duodenal cap formed readily and the contraction waves of the stomach were uninterrupted. The icteric index was 100. Blood smears showed a picture tyical of pernicious anemia with anisocytosis and poikilocytosis. The blood Wassermann was negative, as was the blood culture.

In spite of the negative Wassermann he was started on KI, and later was given weekly injections of bismuth. He was also given iron and arsenic hypodermics in an effort to stimulate blood formation. He did not respond readily to treatment and became worse in the first week in December. The abdomen became more distended and there was dullness in the flanks. He gradually became weaker and died Jan. 9, 1926, six months after the initial onset of the disease.

At postmortem the following conditions were noted: There was extreme emaciation, marked jaundice and an intense enlargement of the abdomen, so much so that there were striae similar to those seen in pregnancy. On opening the peritoneum about six liters of a bile stained fluid escaped. The liver was greatly enlarged and the surface was covered by numbers of yellowish nodules from .4 to 1.5 cm. in size. The cut surface revealed similar masses throughout the entire liver. The liver weighed 4750 gm. The stomach had a mass on the anterior inferior margin 4 x 9 cm. in size, hard and nodular. It extended to about 5 cm. from the pylorus. There were hard masses throughout the omentum, and the gastrocolic mesentery was studded with them. There were several nodules in the gastrosplenic ligament.

The spleen, kidneys and plevic organs were normal. The heart was small and flabby, weighing 210 grams. The aorta was not as large as fluoroscopy would indicate. On the intima were a number of yellowish plaques and a general roughness. Spinal fluid was obtained, which had a negative Wassermann reaction. Microscopic examination of the tumor masses by Dr. D. H. Nickson showed primary adenocarcinoma of the stomach with metastases of this tumor in the liver and mesentery.

There are several interesting phases of this case. First is the rarity of cancer in the young. It occurs so infrequently that its presence is seldom suspected. De la Camp found 19 cases under twenty years of age in a series of almost 10,000 cases of cancer. The greatest number of cancers in children or young people are to be found in the stomach. Osler and McCrae, in 1909, found 23 cases under twenty years of age in a series of 7,000 cases of gastric carcinoma, with less than 1 per cent occurring under twenty-five years of age. The location of this tumor was also unusual. In Welch's analysis of 1,300 cases of cancer of the stomach the tumor was located most infrequently in the fundus, and the next most infrequent site was the anterior wall, less than 2.5 per cent of the total.

The difficulty of diagnosis should also be stressed. With symptoms of pernicious anemia and also of syphilis, his trouble was thought to be due entirely to the latter disease, in spite of his negative Wassermann. The Public Health Service in recent articles has emphasized the recognition of this condition from its clinical manifestations instead of relying solely on the serologic findings. It was on this basis that bismuth was administered. With the indefinite symptomatology and the conflicting laboratory data, it would appear that a premortem diagnosis of cancer of the stomach would have been practically impossible.

SURGERY OF TRACHOMA. S. Lewis Ziegler, Philahelphia (Journal A. M. A., Feb. 6, 1926), asserts that the complications of trachoma are persistently maintained by two mechanical processes: (1) lid friction, from blepharophimosis and trichiasis, and (2) lacrimal maceration, from perversion of the tears and obstruction of the duct by trachomatous invasion. The practical problems involved are: (1) to preserve normal tissue by conservative surgery, or, if this fails, (2) to resort to radical surgery. The conservative surgery of trachoma calls for (a) canthotomy and (b) rapid dilation of the duct, combined with (c) galvanocautery puncture, (d) Knapp's roller operation and (e) freezing by carbon dioxid snow; while (f) galvanocautery peritomy may be used to relieve pannus.

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* Read before the Staff Meeting of Swedish Hospital, Seattle, Wash., January 26, 1926.

WHY A CHILD WELFARE DIVISION IN THE STATE BOARD OF HEALTH?*

FRANCES S. BRADLEY, M.D.

HELENA, MONT.

I am sure we have all read with interest the recent discussions in the *Journal American Medical Association* concerning the inadequacy of medical service in rural sections. We may accept Dr. Pusey's statements that there is a very real shortage of doctors, or agree with Dr. Pearl and others that the shortage is more apparent than real, and is offset by the increased number of hospitals and by Mr. Ford's contribution to the transportation problem. However, figures speak for themselves. We know that in Montana we have 523 doctors to 555,000 people or 1 to more than 1611 persons, when the average for the country is 1 to every 726.

Added to the shortage per capita is the shortage per mile which in a state of the vast proportions of Montana constitutes a definite complication. Our population is scattered over 146,131 square miles or one person to every 3.8 miles. If a man living 15 or 20 miles from a doctor has to pay two or three dollars for the first mile and one dollar for every succeeding mile, he simply cannot afford to get sick. In fact, a good stiff doctor's bill for the first visit is a sure preventive of a second attack. We have no reason to feel that there is less need of doctors than formerly, yet many state health officers report that counties which twenty-five years ago had three or four doctors, today have two, one or none.

To meet this condition, Massachusetts and other states are authorizing counties or communities to offer subsidies to supplement what a physician may earn from his fees. This may not seem ideal, and a better plan may be devised as the group or clinic method of the city, or a county hospital with sufficiently modern, scientific equipment to attract and hold the rural physician.

Surely the rural population is entitled to as good medical service as the urban population, and whether the problem is medical, social or economic, the wares for sale are not potatoes, furniture or railroad stock. It is a matter for the solution of the doctor and his patients, how he can best get across to them the service they need and which he alone can give.

Perhaps we do not realize the extent of the unworked medical field. According to Dr. W. S. Rankin, State Health Officer of North Carolina, "The profession and the public have a large mutual interest which unites them in a common task and draws them toward a single objective. That interest consists of a surplusage of unnecessary, untreated and inaedquately treated disease and impairment, which in its totality constitutes a waiting field of medical practice from two to five times greater than the present occupied field."

The Life Extension Institute of New York in the past two years has examined about 250,000 of both sexes, all races and conditions, engaged in various industries and living in different parts of the country, the persons examined being selected indiscriminately. The institute found that about 60 per cent of those examined were in need of treatment and that not more than 20 per cent were receiving it. In short, it was found that in adult pathology the field was about one-fifth occupied and four-fifths unoccupied.

During the period of adolescence, the age of sex awakening and social restraint of sex impulse, the premarital state, we find susceptibility to, prevalence of, and damage from venereal disease the greatest. With syphilis causing one-tenth of all deaths, producing 20 per cent of all inmates of institutions for the insane, with gonorrhea as the chief cause of sterility and the principal contributor to the gynecologic wards of the hospitals; with its enormous drag upon efficiency and industry, a group of diseases which in the height of war took more men out of the line of battle than shot, shell or gas, and you have a field of medicine that largely sustains three specialties, gynecology, genitourinary and skin disease, and in addition contributes to the general run of the practice of medicine. How much of this field is occupied? From 16 to 20 per cent of venereal diseases are reported by doctors and perhaps not more than twice that percentage, 30 to 40 per cent, are treated by the profession. Of those cases treated by doctors it is safe to say that they do not receive or take more than one-third of the treatment needed in the interest of both patient and public. No one well informed as to the prevalence of this group of diseases can seriously consider the treatment given as compared with the amount needed, without agreeing that the unoccupied field in this sector is from two to five times greater than that which is adequately held by the forces of medicine.

Especially are we interested in the neglected field of maternity and infancy. We find that at the very source of life we have from 25 to 35 per cent, say an average of 30 per cent of the birth of this country, a total of 750,000 a year, unattended by physicians. These women pass the valley of the shadow of death with no ray of the light of science to dispel its gloom, and with only the flickering candle of the midwife or the maternity home to guide them through their travail. Add to the labors without medical attendance, the enormous unsupplied need for supervision during pregnancy; add again the need of the puerperal state for medical care so inadequately supplied, and you have an uncared for field of maternity and infancy from two to five times the size of that which is cared for.

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* Read before the Forty-seventh Annual Meeting of Medical Association of Montana, Lewistown, Mont., July 8-9, 1925.

From infancy we pass to childhood. Add the absent, delayed and inadequate attention to the cases of acute diseases of early life—measles, whooping cough, scarlet fever, diphtheria, meningitis, early manifestations of tuberculosis, etc., and add to the common defects of childhood the 20 per cent, or 4,000,000 public school children of the country with defective vision; and the 75 or 80 per cent, or 15,000,000 public school children whose mouths need treatment in order to prevent subsequent digestive disturbance, rheumatism or cardiovascular damage; and the 5 per cent, or 1,000,000 public school children who need operations for tonsils and adenoids; and again consider the relative sizes of the occupied and the unoccupied fields of medicine.

This great surplusage of disease makes the interest of the profession and public one, binding the doctor and the citizen in a common purpose, but it remains for the physician, the leader, to point the way, unless indeed we wish to step aside and turn over the field to the quacks and practics.

The rural doctors of Montana are for the most part progressive, public spirited men. They are serving more than twice the number of patients and covering more than twice the amount of territory that is humanly possible in justice to themselves or their public, yet the people are not getting the service they need. I ask you what are we to do about it?

We deride the customs and superstitions of the primitive Indian and Negro, yet are ourselves as hidebound as they in clinging to threadbare tradition. We assume that mother knowledge comes with mother love, and rail at the young mother, when she weans her baby or feeds her older child unwisely, yet she is doing the best she knows how. A most intelligent mother loyally defended her doctor who, she claimed, was giving her malnourished child a tonic, but was too busy to bother with a dietary. We preach hygiene and sanitation, yet allow polluted water and insanitary toilets in our schools. We preach reporting and isolating communicable disease, yet wink at a neighbor or friend who gets by without placarding his home. Even the teacher will urge that as so many children have whooping cough they may as well all come to school and whoop it out together. She considerately allows five or ten minutes after the excitement of recess for a concerted paroxysm of coughing and an upheaval of the barely swallowed lunch before resuming the day's work. The picture assumes a different aspect when the child of a teacher or trustee dies from one of these diseases, and we have an occasional object lesson in the teacher who advised parents against the medieval custom of vaccination; or in the osteopath whose promised treatments were a sure preventive of smallpox, only themselves to die of this loathesome disease.

A doctor will admit that his little patients were down on Thursday with scarlet fever and back in school again on Monday, yet urge us to "rub it in" on the parents of those children. Another physician has a mother ill of quinsy in one bed with her baby, and an older child sharing the bed of a sister in the second week of typhoid fever. On a chair by the pillow is an open bottle of milk, and beside it a slop jar for the convenience of the numerous small members of the family. The solicitous father runs up from his barber shop below and waits on his family between shaves. The doctor tells us to "give him hell," yet states emphatically that he does not want a county nurse because one whom they employed a few years ago proved unsatisfactory. It would go hard with us doctors, if we were held up to this rigorous standard.

Had there been a nurse in a county recently visited, a woman in labor would not have been driven thirty miles in a rough lumber wagon to the nearest town. Her baby was stillborn by the wayside and, with neither medical or nursing service, her husband jolted the mother with her dead child back to the little saw mill shack.

In another county, a woman was hurried in convulsions to a maternity home which would not risk its mortality rate, so sent her to the nearest hospital where she and her baby died the following day. With a county nurse employed, each of these women would have been brought under the supervision of her family physician. He would have been given a chance to watch the urine, blood pressure and the like, and Montana might have been today at least three citizens to the good. With a county nurse employed, pregnant women are brought to their physicians, babies kept under his care, parents are made to realize that Johnnie's tonsil's need the care of a doctor, his teeth that of a dentist, and that Susie is not just lazy or stubborn when she drags one foot, falls often and finds it impossible to walk up stairs.

Really and truly we all know that education is the key to the situation and that none can educate except the physician or his representative. We cannot fool all the people all the time. After making three unsuccessful attempts to enucleate a bulging tonsil, we cannot complain when the little victim is taken to another doctor whose fingers are not all thumbs. When we leave a woman with a torn perineum for the next doctor to repair, we have only ourselves to blame. When we fail to straighten the club feet of a newly born baby, we must expect to see his parents step on the gas and speed to the nearest osteopath or chiropractor.

Sometimes we are even a little shaky on our nomenclature. A recent death certificate bore the doctor's diagnosis of "matrimony" as the cause of death. On a birth certificate the occupation of the father was given as "hunting fishing worms." Obviously this was an idyl of the spring.

The nurse of course is far from perfect and I would refer you to the funnies on the final pages of the *Journal American Medical Association* for as many jokes at her expense as you have the time and inclination to read. She is human and makes mistakes, just as you and I. Nevertheless our child welfare nurses in Montana represent a fine type of women. They have had, besides their hospital training, full courses in public health (which is more than some of us have had), one at Western Reserve, one at Columbia University and one at Johns Hopkins. The county nurses are not quite so well equipped, though with but one exception all have had a certain amount of public health training in addition to their hospital work.

Each is instructed at headquarters to seek always the approval and cooperation of local physicians and to do only educational work. By the nature of her training, however, she cannot help recognizing strabismus when she sees it, or an inflammation of the eye, ear or throat. She even knows the six year molar and the importance of its preservation. She identifies a goiter, if the thyroid is sufficiently enlarged. In fact, she has been instructed by some of our best physicians to aid in county surveys to determine the incidence of this condition with a view to its control.

The county nurse will weigh, measure and inspect children, referring to the busy doctor cases needing his attention; she will instruct pregnant women and young mothers in the better care of themselves and their children; give practical demonstrations in hygiene and sanitation, bathe the doctor's typhoids, syringe ears and, if instructed by the physician, will swab throats, immunize against diphtheria, typhoid and smallpox. She will arrange clinics for refractions, tonsillectomies, dental corrections and, though actually increasing the amount of work by the local physician, she will relieve him of details just as the bedside nurse relieves the hospital man of the details of medical or surgical procedure. She must, however, work under the supervision of the medical profession.

The public must be educated and we might study with profit the methods adopted by other departments. Visit the banks and chambers of commerce of any small town and read the leaflets displayed on the importance of prenatal care to prevent the stunting of turkeys, pigs and other live stock. See the small tents or "jugs" scattered over the sheep ranch, where the ewe may have her young in peace and quiet. Investigate an up-to-date dairy and be denied admittance to the milking room until the cows are tethered and feeding quietly, lest you make them nervous and limit their supply of milk. Then stop by the house and find the wife cooking for thirteen husky thrashers, a three weeks old baby wailing on the bed for milk she is too tired to furnish.

Attend a farmers' short course and hear discussions of "breed for seed," "better sires, better stock," and remember that scrub males, in fact males of high and low degree, are barred and bolted from the soceity of their choice at certain periods. Do we show the mothers of our children this consideration?

Occasionally a doctor of the old school complains that the nurse "butts in," if perchance she sends him one of his own patients with granulated lids or infected tonsils; he may protest that she makes him scrub up too much on his obstetric case; or he has been known to ridicule a pregnant women whom the nurse sent to him for examination and supervision. The younger man, however, reminded of his recent hospital days, welcomes the nurse. He rounds up women who need more instruction than he has time to give; arranges children's health conferences, examines children, and with the nurse's aid makes necessary corrections. He adapts himself to the exigencies of a state of scant medical assistance.

As you know, we furnish silver nitrate to hospitals, doctors, nurses, maternity hospitals and midwives; also blanks upon which you return to us the names and addresses of pregnant women whom you wish supplied with helpful literature, urging that they make early provision for their confinement and keep their young children under the constant supervision of their physician.

Let us keep in mind the ideal of a hospital for every county in Montana; and of at least a minimum health unit as standardized by the Rockefeller Foundation. This constis of a full time health officer, a public health nurse, and a clerk and laboratory assistant combined. The hospital, of course, is expensive and would be useless without the physician and nurse. The whole time health officer is equally beyond the reach of most of our counties. But the public health nurse is within the reach of practically every county in the state and she is believed to be the logical wedge to the desired end. Meeting with the parents of sick children, with the teachers of retarded pupils, with officials of towns burdened with undesirable victims of preventable defects, she can point the need, without being misunderstood by the community, of a more adequate medical service, of municipal obligation and of a comprehensive program.

As you know, Montana's birth rate for 1924 was the lowest in the union, 18.3 as compared with 31.9 in North Carolina and 22.5 in the registration area. In 1923 our maternal mortality rate was 7.5 as compared with 6.4 in the registration area, and the United States stands fourteen from the top among civilized nations in the protection given her child-bearing women.

To meet this situation our legislature in 1921 approved the terms of the Sheppard-Towner Law with which you are all familiar, and appropriated $8,752.91, which sum was matched dollar for dollar by federal funds, and a bonus of $5,000.00 per year added. That is, for an investment of $8,751.91 we have $22,701.91 per year for a period of five years to devote to the protection of our mothers and children up to six years of age. To date this money has been expended as follows: an office force consisting of a director and clerk, a bookkeeper and statistician combined, and a part time laboratory assistant who makes Wassermanns, smears, urine, blood, sputum, diphtheria tests and the like.

Our field force constis of four public health nurses, assigned to definite district. The Sheppard-Towner Law limits us definitely to the periods of maternity and infancy. However, the overhead expense of restricting nurses to this one field of work would be prohibitive in a state of such great distances; also the mother often particularly needs help with an older child. Arrangements have been made, therefore, with the Montana Tuberculosis Association, whereby that organization bears one-fourth of the expense of these nurses and receives a proportionate amount of work. In this way we meet the requirement of the law and give a more generalized service.

Sheppard-Towner funds are also used to supplement local moneys in certain counties not yet able to finance a nurse. These funds are transferred as counties are able to assume their own obligations.

I ought to say that one of the conditions of the Sheppard-Towner Law is that its federal administration be in the hands of the United States Children's Bureau, and its local administration in a Child Welfare Division of the State Board of Health, if such a division be in existence, as in Montana. This would seem its logical location for the work, while purely educational, is along medical and nursing lines and its success depends upon the endorsement and cooperation of the medical profession. I feel sure that in the other forty-five states operating under this law the physicians have shown the same splendid spirit as you men of Montana. The demonstration is now more than half over, and its continuance rests in your hands. Your representatives in Washington will vote according to instructions, which only a group like this is qualified to give. It is for you to say if we are a help or a hindrance to Montana.

The Pes Cavus of Congenital Syphilis. The cases observed by C. W. Goff, South Manchester, Conn. (*Journal A. M. A.*, Feb. 6, 1926), in which a positive diagnosis of congenital syphillis was made, showed many characteristic stigmas. A pes cavus, generally bilateral, occurred in practically every case of congenital syphilis and did not occur in the control cases that were free from syphilis. This pes cavus with its characteristic pseudohammer toes, Goff avers, constitutes a new, hitherto undescribed stigma of congenital syphilis, and apparently is dependent on a neuromuscular condition for its pathogenesis. This is denoted further by a very slight scoliosis, tilting of the pelvis, muscular tautness of the hamstrings and variability of the reflexes. Posture and wearing of high heels have no influence in the production of the pes cavus of congenital syphilis.

MATERNITY AND INFANCY ACT

ITS ADMINISTRATION IN MONTANA MAY 1922-JUNE 1925

HAZEL DELL BONNESS, M.D.
HELENA, MONT.
Director Division of Child Welfare
Montana State Board of Health

The Sheppard-Towner Act of November 23, 1921, is a federal act for the promotion of the welfare and hygiene of maternity and infancy. This act makes available to the various states, if matched by state funds, a sum of money (the amount in proportion to the population) and in addition a gift of five thousand dollars. This money is used for reducing infant and maternal mortality and for promoting the health of mothers and infants.

This act is administered by a federal board, consisting of the Chief of the Children's Bureau, the Surgeon General of the United States Public Health Service and the United States Commissioner of Education. All plans for the work originate in the states and are administered entirely by them, but these plans must meet the approval of the federal board before the money is used. The federal board requires strict conformity with the purpose of the act, and in addition the states must make semiannual reports of their activities to the board and they must also conform to the bookkeeping regulations of the Children's Bureau.

There are three points specifically stated in the act which are of interest and should clear up any doubts concerning its purpose.

1. It is specifically stated that no agent of the Children's Bureau has, under this act, any right to enter a home over the objections of the parents, and that nothing in this act shall limit the power of the parents to determine what treatment shall be provided for a child or what agencies shall be employed for this purpose.

2. That money appropriated under this act shall not be used for the payment of any maternity or infancy pension, stipend or gratuity.

3. No portion of any moneys appropriated under this act shall be used directly or indirectly for the purchase, erection, preservation or repair of any buildings or equipment, or for the purchase or rental of any buildings or land. The last two points are to prevent the money being used for capital expenditures which would defeat the purpose of the act. The first provision protects parents from unwarranted interference or attention.

At the present time some forty-three states and the territory of Hawaii are cooperating with the Children's Bureau in the carrying out of this act. In general the programs of the various states have included educational propaganda on maternity and infancy hygiene, work for the improvement of vital statistics registration, prenatal and infant clinics, educational work with midwives, Little Mothers' classes, dental hygiene, nutrition work with preschool children and other measures of a like nature. Modifications of this type of program are made, appropriate to the state.

The work in Montana was begun in May, 1922. The first year was spent largely in acquainting the people of the state with the nature of the work and in making a beginning in our program. Since that time the program has developed rapidly until at the present time we have several well defined objectives. At the outset it was admitted that we could not get very far with our maternity and infancy program without proper vital statistics, as upon satisfactory registration depends our accurate knowledge of mortality rates. We have made it a part of our program to aid in every way possible the registration of births and deaths in Montana. Secondly, we have felt that it is impossible to do any sort of permanent work in the maternity and infancy field without county public health nurses. To this end we have aided in the establishment of county nursing services wherever possible. The third feature of our work has been an intensive compaign of educational health conferences, carried on through our field staff and of educational propaganda through our office.

Our state field staff at the present time consists of four nurses. This staff is maintained in cooperation with the Montana Tuberculosis Association; one field nurse is maintained by the Tuberculosis Association and three by the Board of Health. Our nurses hold baby and prenatal conferences and give lectures and demonstrations. In addition to our state field staff, we are carrying on the policy of aiding in county nursing services.

The following counties have received aid in their nursing services to the extent of one-fourth of the nurse's salary during the year.

Daniels County	one year
Pondera County	one year
Beaverhead County	one year
Fergus County	one year
Wibaux County	one year
Fallon County	one year
Prairie County	one year
Cascade County	one year
Lewis and Clark County	three years

Missoula County	three years
Dawson County	one year
Gallatin County	one year
Powell County	one year
Flathead County	one year

Our office work includes cooperation with the Division of Vital Statistics in securing the registration of births. We have provided postal cards for the notification of parents that their baby is registered, since 1923. Beginning this year that department is using certificates provided by the United States Census Bureau, but the Child Welfare Division is providing the clerical assistance for carrying on the work. This division also cooperates with the hygienic laboratory to the extent of employing a technician. The technician makes possible the Wassermann work on prenatal cases and on infants, and also the urine examination service which we have recently instituted for pregnant women living in rural districts.

The office work of the Child Welfare Division is largely educational and consists of the ordinary office routine of issuing supplies to nurses; sending out literature used and distributed by the department; distributing silver nitrate for the prevention of ophthalmia neonatorum; distributing maternity belt patterns, layette patterns, etc. Exhibit material is available for loan at child health exhibits, and we also have a number of excellent films which are loaned without charge. We maintain twelve traveling libraries which are loaned to communities for periods of three to four months. The libraries contain books on health subjects of interest to the general reader. We also maintain a reference library of about two hundred and fifty volumes which may be consulted at any time at the office of the Child Welfare Division or may be loaned to individuals for a period of two weeks. In addition we have a very valuable library of magazines on child health and child welfare, and our current files contain practically all that is worth while in this field. These magazine files may be consulted any time at our office but cannot be taken out.

It is not possible to convey an adequate idea of the amount of work that is carried on in Montana under the provisions of the Sheppard-Towner act without giving some figures. From the beginning of our active field work in the autumn of 1922 to June, 1925, the following work has been done.

Baby and prenatal conferences	1,639
Children examined	20,996
Prenatal cases personally advised	1,669
Prenatal cases which have received our sets of nine letters	1,500
Mothers advised at clinicis, mothers' classes, etc.	10,822
Little Mothers' classes held with an average of 10. Twelve lessons given to each class	59
Baby birth registration cards	30,000
Ampules of silver nitrate distributed	6,686
Laboratory examinations (maternity and infancy only)	4,620
Literature distributed through our office including diet cards, height and weight cards, pamphlets on prenatal, infant and child care, etc.	60,000

It is very difficult to evaluate the results of our education program, as we have no exact scientific measure of the accomplishments. We have ample indirect evidence of the good resulting from the work in the increased interest in maternity and infant hygiene shown all over the state. We have considerable correspondence in our office concerning these matters with women who have been especially interested. Our nurses report that the work is being more and more favorably received, and best of all we know that the children who are being seen for the second, third or fourth time are showing marked improvement in health, and parents are having defects corrected in a most gratifying manner.

While we cannot draw any very definite conclusions concerning our maternity and infancy mortality rates because of the short time the Sheppard-Towner work has been under way, yet I think we may say that we have already been able to lend some influence to the favorable trend of these rates in Montana.

Maternal Mortality		Infant Mortality	
1915	8.2	1915	73.3
1916	9.5	1916	85.4
1917	12.3	1917	94.0
1918	15.6	1918	87.0
1919	11.7	1919	80.0
1920	8.7	1920	72.7
1921	7.4	1921	67.0
1922	7.8	1922	68.7
1923	7.5	1923	71.4
1924	7.1*	1924	65.6

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* Provisional figures.

STUDY OF NINE HUNDRED AND EIGHTY-FOUR DEATHS IN THE PUERPERAL STATE IN MASSACHUSETTS. Susan M. Coffin, Mary F. DeKruif, Mabel A. Southard and Angeline D. Hamblin, Boston (*Journal A. M. A.*, Feb. 6, 1926), give the results of all the deaths (984) occurring in Massachusetts during the years 1922 and 1923 among women six months or more pregnant, from causes immediately related to pregnancy or childbirth, or from causes in which pregnancy or childbirth was a controlling factor. Deaths occurring during the puerperal state from certain complications, such as heart disease, acute infections and a miscellaneous group, are included. Septicemia, toxemia and hemorrhage, causes of death which may be called generally preventable, were responsible for 58 per cent of the deaths. In 591 cases, operative procedures figured. Lack of adequate prenatal care was evident in 89 per cent of the cases.

WORLD WAR OR PEACE

AS RELATED TO THE WORK OF THE CANTON HOSPITAL

J. Oscar Thomson, M.D., C.M., F.A.C.S.
CANTON, CHINA
Chairman of Staff and Chief Surgeon, Canton Hospital

The Far East. Anyone who takes an intelligent interest in human history in the making now has his attention fixed upon developments in the Far East. "In the Far East Europe, Asia, and America are meeting, and there, I believe, the next great chapter of human history will be enacted." "The Age of the Mediterranean has passed; the Age of the Atlantic is passing; the Age of the Pacific is here." To watch the changes has been of extreme interest.

My connection with the Canton Hospital antedates the Revolution, when China under the control of the Manchus still slumbered. The first shot fired at the commencement of the Revolution in 1911 wounded the Tartar General of South China and I was called upon to attend him. While doing so in his Yamen, the great officials of these two provinces of Kwongtung and Kwongsi in their gorgeous official robes thronged the room. The Revolution followed with its battles which brought many wounded to this hospital for treatment. During the past fourteen years, at least in this part of China, upon an average of once a year there have been governmental changes ushered in, accompanied and followed by warfare, frequently on a large scale, the weapons used becoming more modern and effective in the destruction of life of both combatants and civilians. This hospital has served continuously as a base hospital, its staff and equipment being indispensable, since neither the governments nor the military provided an adequate medical service.

Dr. Sun Yat Sen. Finally Dr. Sun Yat Sen, who commenced his study of medicine in this institution under the instruction of my father, organized a more or less stable government with headquarters in Canton, and many material improvements were made. He would not be satisfied, however, until the northern provinces were subdued, and organized punitive expeditions. Over this there was a disagreement between Dr. Sun and his Secretary of War, General Chen Chuing-Ming (who had been a patient of mine in this hospital), and the former was forcibly driven out of Canton. Dr. Sun retaliated by having his five large gunboats bombard the city. Of this we had a good view, as the hospital is situated on the river front. The wounded soldiers from the Bund and the sailors from the opposing gunboats were brought here for treatment.

Finally Yunnanese and Kwongsi mercenaries were brought to Canton to drive out Chen and his troops. Fortunately in this case the decisive battle took place a few miles from Canton. During one night the defeated army passed through the city, and the next night the victors. Judging from previous experiences we expected either or both to loot the city, but this was not done.

Subequently Dr. Sun became suspicious of the intentions of the mercenaries from Kwongsi province. They agreed to retire from Canton, provided they were paid substantially. Having received most of the money they vacated the strategic positions that they had occupied, retired up the Canton-Hankow railroad for a distance of about ten miles, and then attacked the city. During the battle we received so many seriously wounded that we had to use five operating tables simultaneously, in addition to the x-ray apparatus, and also render first aid.

On the Battlefield. Having dealt with these, we wended our way to the northern suburbs, and as we passed the five-story pagoda, which dominates the surrounding country, were invited by a staff officer to ascend and meet the commanding general who had his headquarters there. The view of the battlefield, which comprised many square miles of t rritory, was excellent. The attacking army was defeated.

In the meantime General Chen Chiung-Ming had reorganized his army, and between Canton and Swatow there was fighting back and forth for some time. Several officers having fallen off their ponies and fractured bones, when these tripped over some of the many graves that surround cities, towns, and villages in China, I proposed that they should have their soldiers build roads so that the civil population might at least benefit to that extent from the constant civil wars.

General Chen advanced to the outskirts of Canton, where a big battle was fought. In the retreat of the defenders many wounded were left lying along the railroad, without any food or medical attention. Having been appointed head of a committee to investigate and deal with this situation, I went out with others. We then met the battle, and had a splendid view of this. Gunboats assisted the defenders so that General Chen's army was driven back.

The Hunanese Army. During these events around Canton, similar affairs were taking place elsewhere. The Military Governor of Hunan Province, having been defeated, retreated to Canton, bringing his wounded with him, as he claimed, to help Dr. Sun. Having reached Canton on a Saturday, he immediately called upon me and requested us to take in his seriously wounded soldiers who had retained missiles. I pointed out that already the hospital was overflowing with wounded, even the chapel and other rooms being filled with them, lying on the floor for lack of beds. We had also erected a matshed, and had wounded lying on the floor of that. We had neither sufficient surgeons nor nurses to deal with such large numbers. Replying that they would otherwise all die, he begged that we receive them.

This we therefore did. During Sunday they were brought in and placed on the floor of the matshed, and the dressings changed. All had been shot some time before. We spent the whole day Monday in the x-ray room, filming and fluoroscoping the bullets. The next day we spent in the operating room, removing many missiles, excising and cleaning the wounds. Some in the chest required extraction under the fluoroscope. The following day we again spent in the x-ray room at the same work.

The General Pays a Visit. While we were operating on the next day, Thursday, still at work on the Hunanese wounded, the General arrived and desired speech with us. He said he had three complaints. The first was that many of his wounded soldiers were lying on the floor and not on beds; second, there were not enough nurses to attend to them properly; and, third, many of them had not had the bullets removed. My response was that we had explained to him before their admission that we had no vacant beds, that there would be insufficient nurses, and that none could be obtained. I said that though we had worked practically night and day on his soldiers, such work takes time. The next case to be operated on was one with a bullet in the root of the left lung, close to the pericardium and aorta. I insisted upon the General's being in the operating room, and then in the fluoroscopic room, where we extracted the bullet, so that he would realize what modern surgery means. His army still owes the hospital some hundreds of dollars, even though we only charged them less than the cost of the work, supplies and food, knowing that we would not receive more in any case.

The Merchant Volunteer Corps. The imported mercenary troops from other provinces gradually obtained control of the revenues of this province from the railroads, the public utilities, from heavy taxation and from the gambling and opium monopolies. They became arrogant. Their troops occupied houses throughout the city without paying rent. The civil government had no funds. The civilians became exasperated. The soldiers often looted, and in consequence there was friction between the soldiers and the police force which is an excellent one. The merchants organized a Volunteer Corps to cope with the situation and try to give themselves protection against the soldiers and the bandits. As the Merchants' Volunteer Corps became stronger and purchased munitions from abroad, the government accused it of being a political organization, devised to drive out the government, and accordingly seized the newly imported arms. The volunteers retired into the western suburb of Canton, which still has narrow streets, erected barricades and prepared for defense.

The government had encouraged the labor unions rather than the Merchants' Associations, and had organized what was called by the Chinese a Red Army. With the help of these the government troops attacked the merchant volunteers. Fires were started in various localities. Many civilians were killed by bullets, or burned to death when they could not escape. The volunteers were defeated and disarmed and there was much looting.

Having gone out to visit the new site of the hospital, we were returning on foot through that section of the city, when the fighting commenced. The great fires were so close that we feared for the safety of our patients, staff and buildings.

The Beginning of Antiforeign Agitation. This affair aroused the resentment of the Chinese people in China and abroad. To divert attention and also to secure funds, the government tried to take over the customs revenues, contrary to treaty provisions, and being unsuccessful in this, antiforeign feeling commenced to be agitated. Agents of the Union of Soviet Socialist Republics arrived in Canton, were welcomed, and funds and munitions of war were given to the government. Russian army officers were imported and a military academy established to train, the Chinese say, officers and bolshevist propagandists. Under the direction of the Russian officers all the enemies of the government were driven out of the province, and Swatow was captured from Chen Chiung-Ming's troops. About the same time considerable antichristian propaganda was in evidence. Processions demonstrated against Christian institutions. Some of the Red soldiers even threatened to burn this hospital.

The Present Government Comes Into Power. The responsible Chinese claimed that the government was controlled by the Soviet representatives and a few Chinese communists, and that it was likely that bolshevism would be introduced. The merchant class objected to this. The commanders of the Yunnan and Kwongsi armies also claimed this and made certain demands upon the government. It looked for a while as if there would be a split in the government and armies over this. The government complained that the mercenary troops were robbing the government and the people, and were arrogant and "militarists." Finally the government and all classes of Cantonese, with the Russians, combined against the Yunnan-Kwongsi armies. The latter obtained control of the city of Canton, on the northern bank of the Pearl River, the government troops occupying the southern suburb across the river which is several hundred yards wide, the armies in the country advancing on Canton along the three railroads, from the north, east, and west. The gunboats supported the government. Yunnanese soldiers were posted behind barricades all along the Bund, being also directly in front of this hospital. Directly opposite was the headquarters of one of the opposing armies.

The fighting commenced June 6, when the gunboats passed up the river, firing at the soldiers on the Bund. A shell and many bullets struck our buildings. During a whole week there was constant firing across the river. The hospital was in the zone of bombardment four times. Enough bullets, with a few shells, entered and struck our hospital buildings and residences and entered the compound, to have killed all the staff and patients, but thanks to Divine Providence and constant vigilance, making barricades and vacating buildings, no one was struck, although some of us had narrow escapes. Unfortunately this institution was not built for a fort but as a hospital in the tropics, where air is essential. We urged the soldiers to withdraw from in front of the hospital, and the army across the river not to fire here but without success. Fortunately the final attack on Canton, when the government troops captured the city, took place in the day time, otherwise the mortality among civilians would have been very severe.

The armies advanced to attack along the three railroads and the troops crossed the river simultaneously, supported by gunboats and aeroplanes. A Russian army officer, who is one of my patients, described to me later the military plans. Many of the defeated soldiers were subsequently hunted down by the victors and, sad to say, by the populace too, who claimed that they were only heaping coals of fire on their heads, and murdered. Some came here for treatment. We frequently have many wounded from opposing armies here simultaneously, and have to use tact and firmness to prevent trouble. We have had many interesting experiences.

Antiimperialism Comes to the Front. When there is trouble in or near Canton the well-to-do citizens and many of the government officials take refuge in the foreign concessions and send their valuables there for safety. On this occasion, as the steamers could not moor at the wharves along the Bund because of the fighting, tens of thousands of Chinese refugees were allowed to cross Shameen, the Anglo-French concession about half a mile away, in order to embark.

In the meantime the Shanghai affair of May 30 had occurred. Owing to the fighting here little attention was at first paid to it by the Cantonese. We realized, however, that if the government won out, there would probably be antiforeign demonstrations, as Canton always leads in such matters. As soon as peace came, therefore, preparations were rapidly made for antiimperialistic demonstrations and strikes against Hongkong and Shameen, where practically all foreigners except missionaries live. The government, students and laborers, who with the soldiers and the Soviet representatives are said to take the greatest interest in initiating and fomenting such propaganda, evidently assume that all nations except China and Russia are "imperialistic." Such has been the political background.

Diversions. To relieve the monotony of life here, and to introduce factors into hospital administration and work that are not usually met with in America, there have been other events. Floods have required the vacating of the lower floors of our buildings. The accompanying fire, caused by burning oil floating on the water and many serious fires at other times, have imperilled the hospital and its residents, since the present buildings are situated in the closely packed Chinese city, surrounded by inflammable buildings. There are famines in nearby districts. Typhoons and white ants compel expenditures for repairs. Pirates, robbers and bandits abound, few without their headquarters or "offices" in Canton. Assassinations occur.

There was an explosion in an arsenal in which many were severely burned. We gave them the best modern treatment but many died. In the absence of the foreign members of the staff from the hospital the subdirector of the arsenal visited it, accompanied by a file of soldiers, seized the chief assistant Chinese surgeon and tried to remove him from the premises, obviously for court-martial and execution. This was prevented.

Not long afterwards this same surgeon had to go to his home in the country. For fear of pirates that frequent the waterways, he decided to go via Hongkong. His steamer, when in Chinese waters, was pirated, the British captain killed with others, and the surgeon lost his valuables but did what he could for the wounded.

One evening my wife, daughter and I were returning from dinner in the suburbs. As we entered Shameen we were warned to be cautious as we crossed the concession en route to the hospital, as some one who had just thrown a bomb into the hotel, where the Governor General of French Indo-China was being banqueted, was probably hiding nearby. As a result of the bomb a number of prominent French people had been killed and wounded. The latter were brought to the hospital, where we spent the remainder of the evening attending men and women gravely wounded by fragments of the bomb thrown onto the dining table and by the cutlery.

The Shameen-Shakke Affair of June 23. "What Canton thinks and does today China thinks and does tomorrow." Having been forestalled on this occasion because of the local civil war by the northerners, those responsible for the destinies of this province, as soon as the civil war was over, lost no time in making preparations. The government, the labor and student unions, and the soldiers made plans for a general strike and "antiimperialistic" demonstration on a big scale, directed primarily against Hongkong and Shameen, and therefore chiefly against the British, but in effect including all foreigners. Against the injustice of this the foreign authorities protested, since those in south China were not concerned in the Shanghai affair, but without success. In the third week of June a strike was called against Shameen, and all Chinese in any way associated with foreigners were forced to leave. On the 23d a monster "antiimperialistic" demonstration took place.

As there had been persistent rumor that the demonstration would be a hostile one, the British and French consuls had arranged for the defense of the foreigners living on Shameen if necessary. The Chinese authorities were requested to have the many boats removed from the canal which borders the island on three sides but this was not done. They were also requested not to allow the procession to pass along Shakke, the street bordering the Chinese side of the canal. The British consul general urged his nationals to be most careful not to give any cause for offense. Because of the antiforeign feeling the consuls had already urged their nationals to leave the Chinese city of Canton. My father, the hospital business manager and I remained at the hospital.

As the procession passed here it was orderly, except for a brief panic. The appearance of armed soldiers was not reassuring. We remained near the hospital gate in case of trouble. Just as we were congratulating ourselves that all had gone off well, we heard firing in the direction of Shameen, and shortly afterwards a number of wounded soldiers and a few civilians were brought to the hospital.

Canton Hospital Still Trusted. Full particulars of this affair and its consequences you have probably all read. We at Canton Hospital have been the only foreigners living in the Chinese city of Canton, although, besides the Russians and Germans, there have been several others in the suburbs. The hospital staff has been commended for being able to carry on under present conditions in Canton. This is an indication of the importance and prestige of the Canton Hospital. The American consul, Mr. Douglas Jenkins, wrote, "May I express my admiration for your courage and perseverance in standing by the hospital through all the dangers and difficulties of the past six weeks. Your position was more exposed and more dangerous than that of any other in the city so far as I know, and you deserve the greatest credit for having stuck to it through thick and thin." Captain E. T. Constien, Commander of the South China Patrol of the United States Navy, who has had a very strenuous time protecting foreigners, wrote, "You have been very 'plucky' throughout the whole trouble and frankly my object in desiring to see you at this time was to congratulate you for the manly manner in which you faced the situation. You have done well and we are all proud of you; you stood well, not only among your own, but also among the Chinese." Mr. Sun Fo, son of Dr. Sun Yat Sen, and a member of the present Commission Government, wrote, "We only admire that everything is being conducted in such a good manner in the hospital vis-a-vis the present situation." Many of the highest officials have personally visited the hospital and expressed their thanks for services rendered.

A few nights ago we heard the sounds of two exploding bombs. Out here one soon learns to distinguish the sounds of firecrackers, bombs, rifle firing, machine guns, cannon, etc. Soon a blazing passenger boat came drifting past the hospital, setting fire to other boats, large and small, and wharves as it passed, until there was a series of fires extending over a distance of about half a mile. Robbers, having been refused blackmail, threw the bombs. The wounded were brought to this hospital. Many people were burned to death and drowned. The boats contained ammunition for the use of the guards which they always carry to fight off pirates. This caught fire and exploded. A hot cartridge case fell at my feet as I was on the Bund in front of the hospital. As the wind was from the south and the fires very close at hand, clouds of sparks blew over our buildings, and we again anticipated fire, but were again providentially protected.

Conditions Summarized. I have tried to give you an idea of the political situation in Canton, one of the most important places in the world at present, where world peace or war may be determined. You can also appreciate the difficulties of administering and financing a charitable hospital under such conditions as have existed during the past fifteen years. You can also understand why the Chinese people have reached a state of exasperation, how mixed the motives are, and how difficult the settlement of political, economic and social conditions in such a country.

Canton Hospital's Unique Place. To most of you it is hardly necessary to say much about the importance of this institution and its work. It was the first hospital established in the Orient, founded by Dr. Peter Parker in 1835, so that it has rendered ninety years of service. It was the pioneer American institution. It is one of the largest and without doubt, the most famous foreign institution in China. The Chinese cooperate heartily. It is a union, interdenominational hospital, serving Chinese and foreigners. Recently because of its work the government gave the hospital a splendid large new site, chosen by the hospital. To prepare this for building required the raising of twelve thousand old graves.

Several of the few hospitals in Canton have had to close; others are upset. This one is carrying on and furnishing a practical exhibition of Christian and American benevolence. Its work at such a time is of incalculable benefit to the community and will be a factor in the restoration of peaceful relations. Many years ago it was said of this hospital that "the surgeon's knife is better calculated to conciliate the Chinese than any weapons of war." This is still true.

THE MANAGEMENT OF PERSISTENT OCCIPITOPOSTERIOR POSITION. C. S. Bacon, Chicago (*Journal A. M. A.*, Feb. 13, 1926), summarizes his study as follows: Persistent occipitoposterior position occurs only after the head has descended into the excavation. A primary occipitoposterior oblique position above, at the inlet or during descent is not abnormal, and rotation anteriorly occurs in 80 per cent of all such cases. No attempt should be made to rotate at this stage. If intervention becomes necessary, we may have to choose among a high forceps version, pubiotomy or cesarean section. If a high forceps is selected, the Kielland forceps is the best instrument to use, but it is used first as a tractor, and not until the pelvic floor is reached is rotation attempted. This problem of aiding descent, however, is quite different from that of managing occipitoposterior rotation and should not be confused with the latter. Premature intervention with spontaneous descent in either the occiput oblique posterior or anterior position is to be deprecated, for all high forceps operations are the most serious of obstetric operations. After descent, complete dilatation of the cervix is generally necessary for the long or anterior rotation. Hence artificial rotation should not be attempted until this is secured. In persistent occipitoposterior rotation, as well as in persistent deep transverse arrest, we should first attempt manual rotation, remembering that changing the extension attitude into a flexion is always of the first importance. In case of failure with manual rotation, the Kielland forceps should be applied with their pelvic curve toward the occipit and in the long occipitomental diameter.

LUMBAR PUNCTURE AND PREVENTION OF POSTPUNCTURE HEADACHE. Experiments and experience have convinced H. M. Greene, Portland, Ore. (*Journal A. M. A.*, Feb. 6, 1926) that postpuncture headache is caused by trauma to the spinal dura sufficient to result in excessive leakage of cerebrospinal fluid to the point at which the brain is left without a water cushion. The experiments demonstrated that a greater trauma was produced by the use of a needle with a blunt cutting point than by a needle of the same caliber with a point rounded, tapering and sharp. It was also shown that leakage followed puncture of the spinal dura in every instance in which the membrane was suspended and filled with water, and that the amount of leakage was in direct relation to the size of the needle used. The details and methods employed by Greene in this operation are as follows: 1. The patient should be placed on a table in a comfortable position and should remain motionless while the needle is in the dural sac. 2. A local anesthetic should be used in both the skin and the deeper tissues. 3. A needle with a point that is round, tapering and sharp should be used. The needle should be sharpened so as to resemble an ordinary cambric needle and should be polished each time before it is used. Gage 22 is the most suitable, but a needle one or two sizes larger may be used with good results. 4. After the fluid appears in the hub of the needle it is advisable to aspirate the sample with caution. Two hundred and fifteen consecutive punctures have been done by Greene with a headache incidence of two in the series.

NORTHWEST MEDICINE
The Journal of the State Medical Associations of Oregon, Washington, Idaho and Montana
Devoted to the interests of the Medical Profession of the Pacific Northwest

Editorial Office, 543 Stimson Building, Seattle, Wash.

MARCH, 1926

EDITORIAL

PERIODICAL HEALTH EXAMINATIONS

The subject of periodical health examinations has been featured quite extensively of late in medical journals and before societies. The idea has met with favorable response as a rule, wherever it has been presented. Its practical application, however, does not seem to have been general, and has met with criticisms of various kinds from many members of the medical profession. It has been adopted by the Gorgas Memorial Institute as one of the enterprises which it will foster and aim to popularize among the medical profession and the general public. In order to ascertain whether physicians were ready and willing to undertake the examination of their patients in periodic health examinations—say on the patients' birthdays—and to learn if any of their patients had expressed a desire for such examinations, the Washington State Governing Board, through the Seattle Committee, recently sent out the following list of questions to each member of the medical profession in the state of Washington:

1. Do you favor the idea of periodic health examinations?
2. Do you desire to cooperate with the Memorial in making these examinations?
3. Can you make a complete examination in your office?
4. If not, have you access to x-ray and other laboraties near you?
5. What part of the examination would you have to refer?
6. What would you consider a fair fee for your part?
7. If you are a specialist, kindly state your idea regarding a fair fee for such work.
8. Have you already had any inquiry regarding health examinations, or have you made any for insurance companies, lodges or individuals?

Kindly give us the advantage of any further advice or counsel.

Thirteen hundred and twenty-five of these questionnaires were sent out. The replies are still coming in, and at the time of this writing three hundred and fifty-one have been received. Of these all but thirteen were favorable to the idea of periodic health examinations, and all but twenty were willing to undertake them. This is quite an unusual response to such a questionnaire. Usually not more than ten per cent pay any attention to anything of this kind. The general favor elicited by the questions would seem to make the replies well-nigh unanimous. Some of the answers to the first question were very enthusiastic: "Yes, indeed," "most assuredly," "certainly," "a fine idea," "one of the most constructive the medical profession has ever undertaken," "if the demand is great enough, I will equip an office and organize a staff for this work alone." One physician went so far as to say that, inasmuch as this is to be a "memorial" affair, the examinations should be highly scientific and very thorough and be made gratuitously.

In reply to the third question one hundred and fifty-eight expressed themselves as able to make complete examinations in their offices, one hundred and sixty-nine not being able to do so, twenty-four not replying. Considerable diversity of opinion was expressed as to what would constitute a complete examination. Quite a number seemed to think that such an examination was meant as is now given to an applicant for life insurance. Others seemed to take the Life Extension examination blanks as their guide, others the blanks used by the American Medical Association, while one stated as his opinion that, until the system was established as routine, the examinations should not be made too elaborate nor costly. A good suggestion was made that both physician and patient should be satisfied with such examination as is given for life insurance, unless this uncovered something that would make it necessary for more elaborate special tests. In the latter case the patient would be sent to the laboratory for such tests, the cost of examination being thus increased only as necessary. Evidently, if this system of periodic health examinations is to be established, it will be necessary for the physicians to get together and standardize the blanks.

As to question four, two hundred and sixty-eight have access to the necessary laboratories, sixteen not having such near them, sixty-seven not replying. The special tests most often mentioned as needed for the completion of the examination were x-ray, Wassermann and blood tests generally, eye, ear, nose and throat, heart, metabolism, stools and similar microscopic investigations, etc.

Question five was apparently not very intelligible, the replies often being given in answer to some other question. Occasionally the reply would be rendered meaningless, as when, after stating that examinations for the eyes would have to be referred, the correspondent stated he specialized in ophthalmology. Question six also was rendered confusing by the fact that few of the correspondents were able to determine just what would constitute a complete examination. Instead of stating that he would charge for his part, the correspondent would state what the complete examination would cost. But, to state it in a general way one hundred and sixty-nine thought five dollars would be enough to charge; twenty-five ten to fifteen dollars; seventy about eight dollars and so on, one expressing the opinion that it could not be done right for less than fifty dollars. The majority of the correspondents were already doing this kind of work, if examinations for life insurance, lodge membership, etc., can be taken to mean health examinations. A few stated that certain numbers of their patients came more or less regularly for "a looking over."

Quite a number of suggestive and helpful letters accompanied the replies. We can quote but briefly from a few. One stated he was in favor of the idea and hoped it might become established as a method, but feared that neither the profession nor the public were ready for it. "I feel sure that in my vicinity seventy-five per cent of the people are not now interested in it." Another was of the opinion that in the eastern states, where the method had been in operation, it was falling down in its application to adults but finding a useful field with children. One says: "We must not let these examinations slide along in a perfunctory manner and fall by the board, as the premarriage examinations did a few years ago." Another suggested that the physicians themselves show their faith by taking the periodic examinations. "Judicial publicity will aid. We can not expect to accomplish much through the grownups. It is through the younger ones coming on that we can do the most."

The Amercian Medical Association's Council on Medical Education is urging the medical schools to teach their students proper methods to be used in making periodic health examinations and is fostering the idea in every way. It is believed the results of the above questionnaire will lead to the establishment of periodic health examinations in a manner that will be beneficial to the individual, the public and scientific medicine.

LIBRARY SERVICE IN HOSPITALS

Many agencies in all of our cities have from time to time exerted themselves to relieve the loneliness and tedious days of hospital patients. This condition is particularly evident among convalescents, with whom the hours often drag monotonously, awaiting the period of their discharge. The recent efforts of some our our public libraries to meet the situation are to be heartily commended. This consists of a department which loans books with free distribution and periodical visitation to such patients as their physicians consider to be in suitable condition for such service.

The Seattle Public Library was the first in the Pacific Northwest to establish organized library service in the hospitals of the city. This was started May, 1921, in Seattle General and Virginia Mason Hospitals; November, 1923, in King County Hospital and March 1925, in Swedish Hospital. Books are supplied by the Public Library, most of which form a special collection which is purchased for hospital use. A trained librarian visits each hospital one afternoon a week and takes the book truck to every room that is recommended by the nurse in charge of the floor. Requests for special books which are not in the hospital collection are sent by messenger the following day. Small books, books in large print, cheerful books, and short stories will be found among those which are provided, as well as nonfiction. Travel, poetry, biography and history are the favorite classes. There is some demand for books on the care of children, also on child training, moral and mental.

In each hospital a member of the staff is appointed who issues books to new patients and distributes the special requests sent from the library. Service is free to nurses, patients and the hospital personnel. No library card is required as the books are not taken from the hospital. Each hospital supplies its own book truck which is usually a double-decked dressing carriage. Since the service was started over 41,500 books have been issued, 12,362 being issued in 1925.

FINANCING THE ASSOCIATION JOURNAL

The most vital factor in the existence of any publication is a sufficient income to pay its expenses and maintain its existence from year to year. Every medical journal during its early years struggles with this problem. When it has attained the good fortune of an established income its permanence can be assured with a minimum of anxiety. Northwest Medicine had a prolonged period of such experiences during the earlier years of its history. The situation was relieved when the Cooperative Medical Advertising Bureau of the American Medical Association was established, whose purpose was to aid state association journals in securing desirable advertisements, especially from the eastern section of the country. Coincident with the receipt of such assistance, unethical and undesirable advertisements were excluded, greatly to the advantage of the journals.

In a recent issue of the *Journal of the American Medical Association* the following history of the Coöperative Medical Advertising Bureau has been sketched, embodying its relations to the state association journals and the benefits which they have derived from the assistance thus received.

> In 1913, at the suggestion of the editors of several state medical journals, the work of the cooperative advertising bureau was begun. The cost of operating medical periodicals was proving almost prohibitive in some states. Others, in order to avoid financial loss, were being forced to accept advertising from the makers of doubtful preparations. At that time, many of the state journals were poorly printed on poor paper. Some were small, some large. A collection of them displayed not even the two-by-two uniformity of the passengers in Noah's Ark. It seemed to these editors that a central advertising bureau, located at the headquarters of the American Medical Association, could obtain advertising business not for one but for many journals. In this way, soliciting expense would be spared to the journals and greater circulation obtained for the advertisers. Furthermore, the close association of such a bureau with the Council on Pharmacy and Chemistry would result in printing only the advertising of manufacturers of ethical products, rather than that of any applicant who could pay for space. This year virtually marks the completion of the program set in operation in 1913. Thirty state journals are now members of the Cooperative Advertising Bureau. Only one is not a member of it. These thirty journals are now appearing with a uniform six by nine inch type size of page. Many of them, with the current year, are adopting more attractive covers. All are being printed on good paper. One can turn the pages of almost all of them and never see an advertisement of which an ethical journal would be ashamed. They are solvent and unafraid. The efforts of the state societies, editors and managers since 1913 have had much to do with bringing about this better state of affairs. At the same time, a great deal of credit belongs to those who conceived the idea of the cooperative advertising bureau and to those who have directed its activities, whereby more and better business has been obtained at half the cost of the same volume of advertising if it were obtained through individual solicitors.

THE OREGON ANNUAL MEETING

The annual meeting of the Oregon State Medical Society will be held at Multnomah hotel Thursday and Friday, April 1-2. On account of having the meeting two days instead of three, the morning sessions will begin promptly at 9 o'clock. The tentative program is published below, which may be altered later. The periodic examinations of apparently well persons will be the main theme stressed at the meeting. The importance of the members being personally examined will be emphasized, also the necessity of making such examinations a part of their routine work. The state society purposes to institute a postgraduate course for instruction in this kind of work, with demonstrations, lectures and clinics for the advancement of interest in this special endeavor.

PROGRAM

Thursday, April 1

9 A. M.

Registration of Members and Delegates

Annual Address of President. Dr. Paul Rockey, Portland.

Treatment of Postoperative Pulmonary Abscess. Dr. Emile Holman, Leland Stanford University, San Francisco.

11 A. M.

Meeting of House of Delegates.

2 P. M.

The Treatment of Certain Types of Epilepsy. Dr. G. W. Swift, Seattle.

Nonrelation of Malnutrition to the Instance of Infectious Disease. Dr. H. W. Hill, Professor of Public Health, University of British Columbia, Vancouver, B. C.

Diseases of the Heart and Bloodvessels. Dr. Charles F. Hoover, Lakeside Hospital, Cleveland, Ohio.

8 P. M.

The Examination of Apparently Well Persons. A Demonstration by Drs. Wm. House, Ralph Fenton, John H. Fitzgibbon and Charles R. McClure.

Friday, April 2

9 A. M.

Certain Considerations of the Technic of Skin Grafting. Dr. Emile Holman, Leland Stanford University, San Francisco.

Recent Advances in the Diagnosis of Tuberculosis. Dr. Ray W. Matson, Portland.

2 P. M.

The Diagnosis of Intracranial Lesions. Dr. G. W. Swift, Seattle.

Paper on Internal Medicine. Dr. Charles F. Hoover, Lakeside Hospital, Cleveland.

Physiology, Surgery and Treatment of Arteriovenous Fistula, Experimental and Clinical. Dr. Emile Holman, Leland Stanford University, San Francisco.

7 P. M.

Annual Banquet.

ANNUAL CONFERENCE OF CITY AND COUNTY HEALTH OFFICERS

The annual conference of city and county health officers of Oregon will be held at Multnomah Hotel, Portland, March 31-April 2, at the time of meeting of the State Medical Society. The program for the meeting follows:

PROGRAM

Wednesday, March 31

8 A. M.

Registration of Health Officers.

9 A. M.

"Tourist Camp Inspection." Discussion to be led by Dr. W. C. Belt, Health Officer of Douglas County.

"Regulations for Preventing Communicable Diseases." Discussion to be led by Dr. P. M. Drake, Health Officer of Coos County.

"Periodic Health Examinations." Discussion to be led by Dr. G. S. Newsom, Health Officer of Klamath County.

"New Public Health." Dr. H. W. Hill, University of British Columbia, Vancouver, B. C. Discussion to be led by Dr. A. E. Stuht, State Health Commissioner of Washington.

Luncheon at Multnomah Hotel.

2 P. M.

"Early Diagnosis of Communicable Diseases in the Preschool Child." Dr. L. Howard Smith, Portland.

"Preventing Diseases by Immunization." Dr. V. S. Gearey, Health Officer of Jackson County.

"The Examination of the School Child." Dr. F. W. Wallace, Health Officer of Clackamas County.

"The Diagnosis of Meningitis." Dr. William House, Portland.

"Modern Disease Prevention." Dr. H. W. Hill, Professor of Public Health, University of British Columbia, Vancouver, B. C.

6:30 P. M.

Banquet at Multnomah Hotel.

8 P. M.

Moving Pictures.

"Early Diagnosis and Treatment of Veneral Diseases." Dr. J. Guy Strohm, Assistant Professor, Genitourinary Diseases, University of Oregon Medical School.

UNIVERSITY LECTURE COURSE

The postgraduate medical lecture course of the University of Washington has become an established feature in the medical life of Washington and adjacent states. During each summer a week is devoted to lectures by distinguished members of the profession on important phases of medical and surgical practice. This year the course will be held July 19-23. A splendid group of teachers have been secured, whose subjects will be both interesting and of practical value. It is suggested that in planning one's summer vacation and medical meeting program, the date of this lecture course might well be borne in mind.

MEDICAL NOTES

OREGON

Medical Examining Board. Governor Pierce has appointed as members of the state board of medical examiners Dr. Carl G. Patterson, of Baker, and Dr. James F. Wood, of Portland, succeeding Drs. E. U. Coe and R. C. McDaniel. They will serve for five years.

Cancer Survey. The state board of health held a meeting last month at Hot Lake. Among other matters under consideration, it was decided to make a survey of Oregon in the near future in order to determine whether or not the state has sufficient hospitals to care for incurable diseases.

Hospital Reorganized. Stockholders of Corvallis General hospital have voted to change the organization of the institution from a stock concern to a benevolent or eleemosynary institution. Hospitals of this kind are exempt from taxation and sustain closer copoeration with churches, fraternal and similar organizations.

Tuberculosis Association Annual Meeting. The Oregon Tuberculosis Association held its eleventh annual meeting at Portland, February 23-24. Frederick D. Hopkins, administrative secretary of the organization, and Miss Jessamine Whitney, statistician, attended the meeting. Various problems concerning tuberculosis work were discussed, including those of good health associations, Christmas seals sales, health education and tuberculosis and hospitalization of patients. It was reported that $33,000 was received from the sale of Christmas seals in the state for this year.

County Health Officer Resigns. Dr. L. W. Hyde, of Hillsboro, has resigned as Washington county health officer. He has filled this office since 1918. He will move to Astoria, where he will continue practice.

Dr. C. E. Wilson, of Oakridge, a pioneer physician of Lane County, has moved to Portland, where he will practice in the future.

Candidate for State Senator. Dr. A. B. Starbuck, of Dallas, has entered the field as candidate for state senator from Polk and Benton counties. He has taken a prominent part in local politics, and is now serving as county health officer.

Dr. G. C. Dyott, who has practiced for some time at Cottage Grove, and is now studying in Europe, will locate at Eugene, specializing in eye, ear, nose and throat work.

Dr. W. W. Kettle, of Ione, has moved to Joseph, where he will practice in the future.

WASHINGTON

Sanitarium to be Completed. It is announced that the Cascade Sanitarium, at Leavenworth, has had sufficient patronage of late to warrant the completion of the second story of the building recently constructed. It has filled a need in that section which has met with a response from surrounding cities.

Hospital to be Enlarged. Plans are announced for raising $150,000 by public subscription to add a five-story annex to St. Elizabeth's hospital at Yakima. At present the hospital has one hundred fifty beds, which are not sufficient to meet the demand. The proposed annex will provide forty beds, in addition to headquarters for nurses.

Fasting Specialist Convicted. Several years ago Mrs. Linda B. Hazzard, of Kitsap County, was convicted and served a term in the penitentiary for manslaughter, following the death of a patient from starvation in her sanatorium. Consequently her license to practice was revoked. Having been pardoned by Gov. Lister, she claimed the right to practice had been restored. In the superior court the claim was rejected and she was fined for practicing without a license. If the case is appealed to the supreme court, the ultimate decision will be awaited with much interest.

THE SEATTLE ORTHOPEDIC SOCIETY will hold its annual dinner and clinic on March 13 and 15. Dr. P. B. Magnuson, of Chicago, will be the guest of the Society and will conduct the clinics. The Dry Clinic will be held in the auditorium of the Medical and Dental Bldg. Saturday, March 13, at 9 a. m. The subject will be "Bone and Joint Injuries." The clinic on Monday will be devoted to "Fractures." The Society's dinner will be given on Saturday evening.

CANDIDATE FOR SCHOOL BOARD. Dr. R. N. Hamblen, of Spokane, president of the county medical society has entered the race as a member of the city school board. A physician on the school board of any city is a desirable acquisition.

APPOINTED SURGEON FOR HOSPITAL. Dr. C. F. Eikenbary, who has practiced for many years in Spokane, and is recognized as one of the leading orthopedic surgeons of the Pacific Northwest, has moved to Seattle. He has been appointed surgeon in charge of the Children's Orthopedic Hospital. For several years this institution has catered to the profession as a general children's hospital. It is now proposed to confine its work to orthopedic surgery. the object contemplated at its establishment.

DR. G. T. PENN, who has long practiced in Spokane, has moved to Ritzville, where he will practice for the future.

MEDICAL WEDDING. Dr. Edward J. Stubbs, of Seattle, was married to Mrs. Bessie N. Moore, January 30. They have departed for a trip to Europe, where they will remain for a prolonged period.

IDAHO

BULLETIN

IDAHO STATE MEDICAL ASSOCIATION

NOTICE! ! !

Annual meeting of the Association will be held at Sand Point September 2-4.

REMEMBER

Your annual dues for 1926 are $6.00 and are payable to your local Secretary.

The Secretary of the Oregon Society, Dr. F. R. Stricker, has worked out some good reasons for joining your Association and I am going to give them to you verbatim.

1. Modern medicine is keeping stride with scientific research. Membership in the State Association gives you a scientific standing.

2. Membership in the State Association provides you with publications recording the latest developments of the Medical Association.

3. Membership in the State Association permits you to discuss with the leaders of the profession medical problems.

4. Membership in the State Association gives you entrance to medical societies in any state of the United States.

5. Memberships in the state and local society are necessary before you can affiliate with the reputable, professional societies of the country and the American Medical Association. In some states a year's membership is required before they can secure a license by examination or reciprocity.

6. Membership entitles you to a card in the directory of licensed physicians.

7. Members will be supplied with literature for distribution among their patients on what scientific medicine is doing to prevent disease.

8. By paying your dues you are advancing funds to promote better medical legislation.

9. The society has an active committee on Workmen's Compensation, making it possible for every physician to secure this work.

10. The welfare of your organization depends upon the support you give it. A well organized profession means greater respect and better compensation.

Yours for a rousing meeting,
DR. J. N. DAVIS, SECRETARY.

RESIGNS FROM OFFICE. Dr. John W. Givens has resigned as superintendent of the state asylum for the insane at Orofino. He has been at the head of this institution for more than twenty years, and is well known to the whole profession of the state.

MONTANA

ANNUAL MEETING OF MEDICAL SOCIETIES. The Medical Association of Montana will hold its annual meeting at Billings, July 14-15. The Academy of Oto-Ophthalmology will hold its annual session July 13. The State Board of Health will also meet there July 12-13.

PAY ANNUAL DUES. The secretary of the state association urgently requests the members to pay their annual dues as promptly as possible. Don't delay until late in the season before making remittance, but do it now.

RABIES IN MONTANA. Recently a number of persons in Belgrade were bitten by a rabid dog before he could be captured. These people are receiving vaccine at the present time. As a result of this outbreak Belgrade passed an ordinance requiring all dogs to be vaccinated and several other towns are contemplating similar measures.

DR. WILLIAM WILD, field representative of the American Society for the Control of Cancer, talked in Helena February first before the Kiwanis Club at luncheon and before the district nurses' association in the evening. He showed a number of lantern slides giving cancer statistics.

McCone and Prarie counties have recently instituted a bicounty nursing service with aid from the Montana Tuberculosis Association and the Child Welfare Division of the State Board of Health. Miss Margaret Robertson has been appointed county nurse. She was formerly with the Natrona county health service at Casper, Wyo.

OBITUARIES

Dr. Flora A. Brown Casseday, of Portland, Ore., died February 3, aged 72. She was born in Willoughby, Ohio. She graduated from Hahnemann Medical College in 1898, when she was 44 years of age. She first lived in Portland in 1887. Later she returned to the Middle West and studied medicine, later returning to Portland where she practiced for twenty-seven years.

Dr. John Benson, of Colfax, Wash., died January 27, of pneumonia, aged 76 years. He was born in Pennsylvania in 1850. At seventeen years of age he moved with his parents to South America, where he enlisted in the Peruvian army in the war with Chile. At his discharge he held the rank of major. He was wounded and left for dead on the battle field. Returning to the United States he studied medicine, and settled in Colfax more than thirty years ago. For many years he served as health officer.

Dr. John Pipher, of Nampa, Ida., died January 28, from cardiac disease, aged 77. He was born in Wiesbaden, Germany, in 1848. At the age of five he moved with his parents to America, settling in Maryland and later moving to Des Moines, Iowa. He graduated from Cincinnati Medical College and after practicing for six or eight years, settled at Griswold, Iowa. He served in that town for several years as postmaster. He practiced in that location for twenty-five years. In 1905 he moved to Nampa. He was prominent in civic and church circles.

Dr. Ira Leighton, of Boulder, Mont., died at Anaconda, February 3, as result of cancer from which he had suffered for many years. He was 67 years of age. He was born in Pittsfield, Me., in 1859. He was a graduate of the University of Michigan. He located at Boulder in 1885. He was surgeon for the Great Northern and Northern Pacific Railways, and was county physician for Jefferson county for nine years. He was prominent in politics, serving for two terms in the state senate and two in the house of representatives.

Dr. Ernest Barton, of Portland, Ore., died February 8, from cardiac disease, aged 70.

REPORTS OF SOCIETY MEETINGS

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., W. C. Woodward; Secty., O. H. Christoffersen

A General Meeting of King County Medical Society was held at Seattle, Feb. 1, 8:15 p. m., President Woodward in the chair. Minutes of Jan. 4 were read and approved. There were 92 members present.

Applications for membership were read of Drs. K. W. Amano, E. L. Botts, S. E. Doolittle, A. E. Henby and W. G. Hiltner.

On motion of Dr. H. D. Dudley it was voted that the Secretary be instructed to extend to Dr. Nickson the Society's sympathy and best wishes for a speedy recovery.

Mr. Fred W. Catlett spoke for a few minutes on the merits of the City Manager Plan.

Dr. J. B. Eagleson gave an interesting resume of the Gorgas Memorial Institute for Tropical and Preventive Medicine. He outlined the purpose of the organization, giving details of its development in national, state and county subdivisions. He explained the proposed plan to promote personal health education, and to carry on research work for eradication of various epidemic diseases. The plan for financing these various enterprises was presented.

Dr. G. W. Swift discussed the paper, commenting on the beneficent work of Gorgas, emphasizing his ideals and aims, also adding his tribute to the life work of Dr. Eagleson. He called attention to the leadership of Dr. Stillson in advancing the interests of this work in Seattle. Dr. Stillson added comments on the points presented by the other speakers.

"Dissemination of Medical Information" was presented by Mr. Joseph Gilbert, in which he advanced the idea that medicine has not captured the layman's imagination. They have not had the name of Gorgas to conjure with. Thousands of health talks in pamphlet form should be distributed through the doctors' offices.

Mr. Robert Jones gave a talk on "Publicity and Organization," in which he expressed the belief that these were the two largest problems before the profession to date. The common practitioner has become too much of a hermit; he must become a leader and an active participant in all public affairs.

PIERCE COUNTY MEDICAL SOCIETY

Pres. E. F. Dodd; Secty., W. B. Penney

The regular meeting of the Pierce County Medical Society was held in its rooms, Tacoma, January 26, Dr. E. F. Dodds, president, in the chair. Minutes of two previous meetings read and approved.

Program

"Fractures of the Elbow," Dr. Roger Anderson, of Seattle, read this interesting paper, illustrated with lantern slides and x-ray plates. It was discussed by Drs. W. A. Rich, C. D. Hunter, C. R. McCreery and V. E. Crowe.

Business

Drs. Cyril V. Lundvick and David H. Johnson were unanimously elected to membership in the society. Dr. MacLean made an announcement in regard to the annual dinner, to be held on February 9 at the Winthrop Hotel.

IDAHO

NEZ PERCE COUNTY SOCIETY

Pres., J. W. Keck; Secty., J. H. Crampton

The annual meeting and banquet of the Nez Perce County Society was held at Lewiston, February 5. There were twelve members in attendance.

The following officers were elected for the ensuing year: President, Dr. S. A. Roe; vice-president, Dr. J. M. Lyle; secretary, Dr. L. B. Stockslager; treasurer, Dr. P. W. Johnson, all of Lewiston.

POCATELLO MEDICAL SOCIETY

Pres., C. P. Groom; Secty., H. H. Hugbert

A meeting of the Pocatello Medical Society was held at Pocatello, February 12. It was decided that influenza is an epidemic ailment and must be reported as a contagious disease.

Dr. J. R. Young gave a report of the meeting of the state accident board in Boise the previous week, which will provide for a more equitable adjustment between the accident board, insurance carriers and the injured person.

SOUTH SIDE MEDICAL ASSOCIATION

Pres., A. F. C. Nelson; Secty., W. F. Passer

The annual meeting of the South Side Medical Association was held at Twin Falls, January 26, at the Park hotel. Thirty-five physicians were in attendance.

Dr. A. C. Jones, of Boise, read a paper on "Sinus Infection and Bronchitis in Children."

The following officers were elected for the ensuing year: President, Dr. Charles Wetherbee, Twin Falls; vice-president, Dr. E. L. Simonton, Wendell; secretary-treasurer, Dr. W. F. Passer, Twin Falls.

MONTANA

WESTERN MONTANA MEDICAL SOCIETY

Pres., R. I. Owens; Secty., L. E. Henderson

The annual meeting and dinner of Western Montana Medical Society was held at Missoula, January 28.

The following officers were elected for the ensuing year: President, Dr. R. I. Owens; vice-president, Dr. T. A. Fitzgerald; secretary-treasurer, Dr. L. E. Henderson, all of Missoula.

Medical Wedding. Dr. G. L. Routledge, of Butte, was married to Miss Jessie I. Gray of that city January 30.

MEDICAL RESERVE CORPS

ASSIGNMENTS OF MEDICAL RESERVE OFFICERS

The War Department has just issued instructions that all Medical Reserve Officers, now unassigned, be assigned to medical units and duties without delay. In accordance with these orders, the assignment of all unassigned Reserve Officers of the Medical Department is now being carried out in the Ninth Corps Area.

In this connection, the Surgeon, Ninth Corps Area, has issued a circular, which quotes the instructions received from higher authority, and says:

"The foregoing means that this office must at once make assignments to units of the 369 officers of the Medical Department Reserve (Medical, Dental, Medical Administrative, Sanitary, and Veterinary), now unassigned, and also the Quartermasters and Chaplains attached to units.

"It is realized that in making, at this time, the assignments now required, it may not always be possible to meet the best interests of vicinity of residence, special professional qualifications, rank, and other local considerations.

"It is proper to say, accordingly, that the assignments which now have to be made should be regarded by Commanding Officers as subject to future readjustments in the interests of the service.

"They should not interfere with the efforts of Commanding Officers of units to secure the enrollments of suitable Medical Reserve Officers from their local communities, with a view to their assignment to places and special duties in their units which may have previously been filled under the requirements of the above instructions. When such enrollments are made, it is the desire of this office to meet, as far as possible, the wishes of local commanding officers in respect to transfers of personnel to make vacancies in their units which would permit of assignments to their units of personnel recruited by them.

"In other words, present requirements need not interfere with the general plan to build up units from local personnel, selected and assigned by reason of special qualifications, and harmonious in all respects. To that end, the continuing assistance of Commanding Officers is greatly desired and appreciated."

The following-named reserve officers are assigned to General Hospital No. 141, Zone of the Interior and to the duties indicated after their respective names:

Major William H. Axtell, Med-Res., 413 Maple St., Bellingham, Washington, as Assistant to Chief of Surgical Service.

Major Clarence P. Gammon, Med-Res., 1107 Fidelity Bldg., Tacoma, Washington, as Assistant to Chief of Surgical Service.

Major William L. Jackson, Med-Res., Burlington, Washington, as Assistant to Chief of Medical Service.

Major John A. Johnson. Med-Res., 1511 Washington Bldg., Tacoma, Washington, as Assistant to Chief of Surgical Service.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Symptoms of Visceral Disease. A Study of the Vegetative Nervous System in its Relationship to Clinical Medicine. By Francis Marion Pottenger, A. M., M. D., L. L. D., F. A. C. P. Author of Clinical Tuberculosis, etc. Third Edition with 86 Text Illustrations and 10 Colored Plates. 394 pp. $6.50. The C. V. Mosby Company, St. Louis. 1925.

The author states this is a study to the usual pathologic physiology in contradistinction -to the usual treatment of diseased processes in pathologic anatomic relationships. While the importance of the vegetative nervous system has long been known to physiologists, clinicians have ignored it and have failed to see its relationship to clinical medicine. This edition presents changes to conform to newer knowledge. The vegetative nervous system is considered anatomically and in its general physiologic relationships. A new chapter is that on the relation of the ionic content and physical state of the cell to activity and nerve stimulation. Part II is devoted to the relationship between the vegetative nervous system and the symptoms of visceral disease, in which chapters are devoted to various phases of reflexes in relation to sympathetic nerves. In Part III chapters are devoted to separate viscera, with a discussion of their innervation and a study of the more important viscerogenic reflexes.

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The name of the product referred to is Neo-Silvol, and the manufacturers are Parke, Davis & Co. Some of the applications of Neo-Silvol are mentioned in an advertisement which appears in this issue.

ABDOMINAL OPERATIONS. By Sir Berkeley Moynihan, K.C.M.G., C.B., Leeds, London, England. Fourth edition, entirely reset and enlarged. Two octavo volumes totaling 1217 pages, with 470 illustrations, 10 in colors. Philadelphia and London. W. B. Saunders Company, 1926. Cloth, $20.00 net.

The present edition of this work shows evidence of a careful though drastic revision, giving us the most recent teachings by a master of his craft. For twenty years the book has stood unrivaled in its presentation of those operations within the abdomen, common to the two sexes. Appropriate chapters on bacteriology, technic and complications and sequels were included with the technical ones, dealing with the various operative procedures. This fourth edition shows the trend of abdominal surgery most clearly and the newer chapters, with deletion of some of the old ones, indicate in a positive way what is expected of him who opens the abdomen for the purpose of surgical treatment.

The chapter on visceral prolapse and of intestinal stasis shows the author at his best. Always conservative in his writings on these subjects and always resisting the claims of intemperate advocates of radical procedures, he nevertheless fairly appraises the results of operations when the indications are correct. His breadth of view and logical outline of future possibilities, expressed in his lucid and interesting style, make the chapter unusually attractive to one looking for the light. The work cannot fail of continued supremacy in its chosen field.

FORBES.

OLD AND NEW VIEWPOINTS IN PSYCHOLOGY. By Knight Dunlap, Professor of Experimental Psychology in Johns Hopkins University. 166 pp. $1.50. The C. V. Mosby Company, St. Louis, 1925.

There is so much fake psychology presented to the public these days that one interested in the subject needs to have his views directed along rational lines. The author states that no one man can cover expertly the total field of psychology. The chapter on mental measurements emphasizes the mistakes of inexpert testers who have rated feeble-minded children normal and normal as feeble-minded, causing parents great trouble and expense. Much publicity was given to the mental measurements of drafted army recruits, stating that the average mental age was 13.5 years, while any observer knew that the draft was not representative of the average male intelligence. The author cautions against the large number of analysts with their extensive sucker lists who are a great hindrance to the legitimate development of psychology. He discusses present day schools of psychology and psychologic factors of spiritualism, developing these subjects in an instructive manner. He calls attention to the character analyst who rates character by external signs, featuring musculature, etc. In reality, he states, we have not yet succeeded in analyzing more than the most gross of these signs. One interested in this subject will find much that is attractive in this monograph.

MEDICAL AND SANITARY INSPECTION OF SCHOOLS. For the Health Officer, the Physician, the Nurse and the Teacher. By S. W. Newmayer, A. B., M. D., formerly Chief of Division of Child Hygiene, etc., Philadelphia. Illustrated with 79 engravings and 6 full page plates. 462 pp. $4.00. Lea & Febiger, Philadelphia, 1924.

With the up-to-date school the question is not, "shall we have medical supervision," but "how shall it be performed." This book is an answer to this question. The author states he does not present statistics from individual cities, but offers a summary of the practical facts observed and his results of many years experience. The principles herein contained have been perfected by actual demonstration. Details are presented of the most scientific and sanitary construction in school buildings. One part is devoted to communicable diseases, stressing the facts of diagnosis which a teacher ought to know, another part dealing with physical defects. Information along these lines will be valuable in the recognition of diseased conditions amenable to treatment and relief.

HEADACHE. Its Causes and Treatment. By Dr. Thomas F. Reilly. Sometime Professor of Medicine, Fordham University, etc. 246 pp. $3.00. P. Blakiston's Son & Company. Philadelphia. 1926.

The subject of this volume is one which interests every practitioner of medicine. The author divides headaches into toxic, caused by infections from various diseases, drugs and gasses; mechanical, resulting from forms of disease in the cranium, in the circulation and like conditions; reflexes, such as eye diseases of many varieties, diseases of teeth, the nervous system, uterus and similar disorders. Each of these is considered in detail. Differential diagnosis is presented in a clear manner. There is much of value in this volume.

THE INTERNATIONAL ANNUAL. A Year Book of Treatment and Practitioner's Index. Forty-third Year. 1925. 548 pp. $6.00. Wm. Wood & Co., New York.

This annual volume is a valuable compilation of the medical and surgical development of the past year. Under alphabetical arrangement are presented the latest information of diseased conditions, reference being made to authorities from all nations. Lucid illustrations amplify the text in sufficient numbers to enhance its value. As a handy reference book it will be invaluable for the practitioner who desires to be up-to-date in his medical and surgical knowledge.

ULTRAVIOLET RAYS and the Treatment and Cure of Disease. By Percy Hall, M. R. C. S. (End.), L. R. C. P. (Lond.) 110 pp. $3.75. C. V. Mosby Company, St. Louis. 1924.

In this volume the author presents facts concerning the effects of sunlight, heliotherapy and ultraviolet radiation, together with modifications of some of these agencies. There is a discussion of the diseases to which these measures are applicable and methods of treatment. The text is somewhat obscure to an American reader, due to the description of English apparatus, different from that used in this country.

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ORIGINAL CONTRIBUTIONS

CHOLECYSTITIS*

E. STARR JUDD, M. D.
ROCHESTER, MINN.

Some years ago it was assumed that all of the essential facts regarding surgery of the gallbladder had been settled and all that remained was to develop the artistic performance of the operation. Recent studies on the physiology of the liver and the efforts to perfect a method of estimating hepatic function and to determine whether the liver is simply an excretory organ or takes part in secretion as well have brought renewed interest to all of the surgical problems associated with this organ. Although the liver performs an important function, it has been shown that an animal can survive its removal, and that, contrary to expectation, the animal gradually becomes jaundiced after hepatectomy. It has also been shown experimentally that the removal of the greater portion of the liver does not seem to interfere with the well-being of the animal in the least. Trauma to the liver or removal of the greater portion of the organ apparently does not produce any change in the results of the tests for hepatic function. If a portion of the liver is removed, a very decided cellular hypertrophy of the remaining portion occurs within a few days. If a rather small piece of hepatic tissue is separated from the body of the organ and allowed to lie free in the peritoneal cavity, the animal will die in a few days; the exact cause for this has not been explained. It is found at necropsy that the fragment has practically disappeared and that the peritoneum is very red and inflamed, a condition similar to that seen in some cases of pancreatitis. This experimental reaction may explain what has been called liver shock and certain symptoms that occasionally follow operations on the gallbladder, in which the liver is unavoidably injured. This may mean that, if a piece of liver is almost separated during an operation, it probably will be best to remove it rather than attempt to save it by suturing it back in place.

Studies of the intrahepatic, vascular and biliary trees, recently made by McIndoe and Counsellor, have provided the best method so far for graphically depicting the normal and abnormal conditions which may occur in the liver. They say that the method of investigating sclerosing and obstructive processes by celloidin injections and corrosion is particularly applicable to the liver. This same plan of study has been carried out on the kidney by Hinman and Brown, and on the thyroid by Terry and Delamere. It has also been used by Huber and a number of others. The particular method used by McIndoe and Counsellor was that devised by Morrison and Hinman and Brown, with some slight modifications.

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* Read before the Portland Academy of Medicine, Portland, Ore., Jan. 14-15, 1926.

The gallbladder undoubtedly has certain definite functions, but just what they are has not been determined. Certain animals have gallbladders while others do not. In some species, one animal may have a gallbladder while another may not. The mouse has a gallbladder but the rat does not, and yet they live in much the same environment and on the same foods. When the gallbladder is wanting, the common duct is usually slightly larger and shorter, and there is usually no evidence of sphincter activity at the termination of the common duct, so that the bile flows continuously from the liver to the intestine. Extensive studies have been carried out to find the structure that carries on the function of the missing gallbladder. It has been suggested that the parietal sacculi of the intrahepatic duct and vasa absentia may become enlarged and filled out and so take the place of the gallbladder. It has also been suggested that, when the gallbladder is removed at operation or destroyed by disease, these inactive embryonic structures connected with the intrahepatic ducts open up and become active, taking over the function of the gallbladder. In our studies[5] of the effects of removal of the gallbladder which were made a number of years ago, and in those made recently by the newer method by McIndoe and Counsellor, very little difference if any could be found in these saccules before and after the removal of the gallbladder. In partial or complete obstruction, however, definite enlargement could be detected, practically proportional to the amount of dilatation of the ducts themselves.

The gallbladder is too important a structure to be sacrificed needlessly and yet there are no evidences that its removal or destruction has any untoward effect. We have shown experimentally and statistically that an animal or a human being will probably live just as long and just as comfortably without a gallbladder as with one. Sometime ago we called attention to the changes that occur when the gallbladder is removed, dilatation of the bile ducts and overthrow of the sphincter activity at the ampulla, with the resultant loss of pressure in the bile flow. This condition exists normally in animals without a gallbladder. From the work of Rous and McMaster we know of one definite change in the bile that results from its stay in the gallbladder, that is, it becomes more concentrated. While, as suggested, the gallbladder may be a storage organ or a tension bulb, these functions have not been proved. Higgins has found in the rat, which possesses no gallbladder, a plexus of fine biliary channels closely applied to the radicles of the portal vein. Since no such arrangement is found in the mouse, which has a gallbladder, he sees the possibility of the plexus being a compensating mechanism analgous to the gallbladder. While nothing has been proved by this study, nevertheless, so far as I know, this is the first time that attention has been called to the existence of such a plexus, and it is hoped that further study may lead a considerable way towards solving the problems of the function of the gallbladder.

I believe that we are called on to operate for cholecystitis or an allied condition more often than for any other abdominal disease. Not only is gallbladder disease recognized more often than formerly, but I believe it occurs more often than it did some years ago. The etiology of cholecystitis has been studied from practically every angle and many different ideas have been brought forth, but the exact cause has been difficult to determine. It was quite natural to assume that the most common cause of cholecystitis was infection and it is likely that infection does play an important part. In some of the earlier reports of the bacteriologic study of gallbladder disease bacteria were found in a higher percentage than we are able to obtain at the present time. It is possible that we are operating in the presence of less inflammation and in the interval more often than formerly, but again it must be said that in some of the cases in which the gallbladder appears to be extensively diseased no organisms are found in the tissue, bile or stones.

A study has just been completed of 100 cases of cholecystitis. After surgical removal, the gallbladder, placed in a sterile dish and covered with sterile gauze, was immediately taken to the laboratory for culture. In no instance was the specimen examined by the bacteriologist later than five minutes after removal from the body. Specimens from the wall of the gallbladder, from the bile, and from the stones which were present in 50 per cent of the cases, were examined in each case. Several different mediums were inoculated in each instance and examined at stated intervals. In spite of the utmost care, contamination undoubtedly often occurred. In most instances appendectomy had preceded the cholecystectomy and from this source soiling of the specimen of the gallbladder inevitably occurred at times. This probably accounts for much of the contamination, even though the specimens were washed one or more times in sterile solution of sodium chlorid. The examination of the tissue of the wall of the gallbladder gave a positive result in twenty-nine cases. This is subject to error, however, as three specimens showed two or more types of organisms. Only five of twenty-two specimens of "strawberry gallbladder" gave positive cultures. In 7 per cent of the 100 cases the bile was bacteriologically positive; in three of these streptococci were found and in three a spore-bearing bacillus.

Gallstones were present in fifty of the 100 cases; in only five instances were we able to obtain a positive culture from the stones, and one of these might have been due to contamination. We were unable to isolate *Bacillus typhi* or *Bacillus paratyphi,* although in 21 per cent of the cases there was an antecedent history of typhoid fever. Mentzer has pointed out that thick dark green bile as found at necropsy is not necessarily indicative of infection of the gallbladder, and there are several instances in this series that support that contention. We found thick, dark-colored bile in sixteen instances. Six of these were in cases of chronic cholecystitis, in four of which culture of the bile and gallbladder wall was negative. Likewise in eight instances of gallstones, culture of the bile, gallbladder wall and stones was negative in seven. In one instance of "cholesterosis," in which thick, dark bile was found, no growth could be obtained from the bile or the contents of the gallbladder.

During the study of the effect of Dakin's solution administered intravenously, Mann showed that the tissues of the gallbladder were the first to be changed, and that a definite nonbacterial cholecystitis could invariably be produced by the intravenous administration of this solution. Under these conditions the gallbladder became very much reddened and tense, and there was an extravasation of blood from the capillaries into the tissues. This occurred a short time after the solution had been injected, and when no change could be demonstrated in any other tissues. Churchman and his associates, working in the Research Laboratory of Bellevue Hospital, New York, on the failure to find organisms in certain grossly inflamed gallbladders removed at operation, came to the conclusion that the pathologic condition is due to changes in the blood vessels and causes other than bacterial invasion. Sweet and Mentzer believe that the presence of lipoid deposits in the gallbladder, in association with "strawberry gallbladder," is evidence of the part the gallbladder plays in the metabolism of fat, and that these lipoids are not the result of infection. While it is very likely that several factors enter into the cause of cholecystitis, nevertheless it is more evident than it formerly was that some of these diseases occur independently of bacterial infection. It is entirely possible that in some instances the cause of the condition may be chemical alteration of the blood.

The clinical manifestations are usually definite. The principal symptom is pain, which is usually very severe, has a sudden onset and radiates characteristically to the back of the shoulders. When this symptom is present the diagnosis is certain; but much uncertainty attends the attempt to diagnose chronic cholecystitis in the absence of colicky pain. Soreness, tenderness, constant dull pain, dyspepsia particularly evidenced by belching and flatus, and many remote symptoms, may result from chronic inflammation of the gallbladder. Since it has been shown many times that the infected gallbladder may be a focus for systemic infection, resulting in rheumatism and cardiovascular disease, it is important that chronic cholecystitis should be recognized. Willius has shown that in 55 per cent of the cases of cardiovascular disease with which cholecystitis is associated definite benefit and modification of the cardiac symptoms will follow removal of the diseased gallbladder. An embarrassing situation with which a surgeon is frequently confronted is for him to find an apparently normal gallbladder on opening the abdomen, when he had every reason to believe there would be definite evidence of disease. Undoubtedly this is sometimes the result of mistaken diagnosis. In other cases, however, unrecognizable disease exists which will be relieved by removal of the gallbladder. The cause of the symptoms may possibly lie in the liver or the pancreas or in some functional disturbance in the biliary tract.

Under normal conditions, when the bile and gallbladder wall are normal, the gallbladder has a blue appearance; sometimes a deposit of fat under the peritoneal coat gives it a much lighter color but this is not likely to be significant of disease. Inflammatory adhesions can usually be distinguished from the peritoneal fold extending from the gallbladder to the duodenum. In studying the conditions of inflammation we have formerly given a good deal of attention to the tension of the gallbladder, and have thought that a tense, noncompressible gallbladder was indicative of cholecystitis. This assumption is undoubtedly correct to a certain degree, but nevertheless we know from the recent investigations by Boyden of Harvard that the gallbladder becomes very tense at certain times, according to the amount and kind of food that has been taken. Boyden has shown by experiments on animals that a regular cycle takes place and that after a period of starvation the gallbladder is always tense. It is probable that the tenseness that we frequently find, and have been inclined to attribute to inflammation, may be the result of the starvation that usually occurs before operations on the gallbladder.

I believe we have recently shown that the diagnosis of cholecystic disease can be made on the clinical manifestations alone. This is a dangerous attitude to take as a general rule because most operative procedures that have had no sounder justification have failed. In the last few years, I have been interested in studies of two groups of cases to determine the end results of operatioins for chronic cholecystitis without stones. The classification as to the grade of cholecystitis was taken from the various pathologic diagnoses. All specimens were diagnosed and graded immediately after the operation. The case histories were reviewed and followed up by questionnaires. One of these series was a group of 100 cases, and the second was a group of 300.

I learned from this study that, if a patient had a typical history of cholecystic disease, with characteristic colicky pain, he would be relieved of his symptoms if the gallbladder were removed, whether or not it showed recognizable disease. This study furthermore seemed to indicate that in cases of cholecystitis grade 1, in which the clinical manifestations were definite but disease unrecognizable at operation, cholecystectomy was followed by cure in a higher percentage than in the cases in which the disease of the gallbladder was graded 2, 3 or 4. The study furthermore showed that, if the patient's symptoms were of the chronic dyspeptic type or if the predominant features were soreness, tenderness, and aching in the side, the likelihood of cholecystectomy promoting cure was not great. It has formerly been thought that in a large proportion of cases symptoms of dyspepsia were the result of cholecystic disease. While this is undoubtedly true, nevertheless the removal of the gallbladder for chronic dyspepsia gives a small proportion of satisfactory results.

It is greatly to be hoped that diagnostic accuracy will be enhanced by the use of the Graham-Cole method of roentgenologic examination. Until this method was evolved very little help was obtained from the roentgen ray. Certain roentgenologists and others have expressed the opinion that they will be able to recognize the presence of inflammation in the gallbladder more accurately by this method than the surgeon can by exploratory operation. While this seems to place a great deal of responsibility on the roentgenologist, the very fact that many patients have been cured of their symptoms by the removal of a fairly normal-looking gallbladder affords some justification for their opinion. There is either some unrecognizable disease in the gallbladder or else its removal produces some change in the liver or pancreas which relieves the symptoms. There are many possibilities of error in the new plan for roentgenologic examination in these cases, and the stage has not yet been reached where a diagnosis can be made by this method alone.

The important problem in cholecystitis is the development of a plan for more accurate diagnosis. The results of operation in these cases are very satisfactory, and the operative risk is very low. A much more serious affair exists, when the disease becomes complicated with biliary cirrhosis, resulting in jaundice or inflammation of the pancreas. The progress made recently in the handling of jaundiced patients can be attributed largely to the efforts of McNee, who has given us a more workable classification of jaundice than we formerly had, and to that of Van den Bergh, Aschoff, and Mann, from whom we have learned how to estimate the degree of jaundice and much about the physiology of the liver. It has been known for many years that calcium had certain effects on the coagulating time of the blood in cases of jaundice. It has been used for this purpose for a long time, but it is only since Walters made a scientific study of how to use it, that a great deal of benefit has been derived from it. Knowing how to study the degree of jaundice and how to use calcium with an occasional transfusion in these cases has reduced the mortality from almost a prohibitive level to a very satisfactory one. Something will eventually come from the tremendous effort that is being put forth on the study of the liver functional tests, but up to the present surgery has not derived much practical benefit from these studies. By all odds the most important test of the patient's condition is the Van den Bergh test for the amount of bilirubin in the blood serum. This shows the exact degree of jaundice; repetition of the test indicates whether the jaundice is increasing or decreasing. It can thus be determined how much preparation is needed and what the risk of the operation will be.

There is no abdominal operation that requires as good exposure as does one on the gallbladder or gallducts. The best exposure can be obtained by a fairly large incision which begins at the ensiform and terminates a little to the right of the umbilicus. I think the principal feature in the incision is that it should be high, with the upper end close to the ensiform. The suspensory ligament can be divided without interference and many times this should be done, as it affords not only better working space but a fixed point on the liver which enables one to lift the liver up and retract the under surface. There is no question in my mind but that it is much safer and better to perform cholecystectomy by beginning the operation at the cystic duct end of the gallbladder than by starting at the fundus. There is an occasional case, in which the lower end of the gallbladder and cystic duct cannot be isolated, in which it may be better to start the dissection from above. After the gallbladder had been removed, the cystic duct and artery should be ligated and dropped back away from the surface of the liver, and, if feasible, the gallbladder fossa should be covered with peritoneum. Up to within a few years ago it was customary to leave an abdominal drain in all of these cases, whether or not there was any infection, or question as to the accuracy of the technic. I have been very much impressed with the results in the cases in which closure was made without one. I began gradually with this technical change but, after having closed without drainage in several hundred cases, I am convinced that in the clean case in which the cystic duct is accurately tied and the oozing absolutely controlled, it is a safer and better procedure. The statistical studies I have made of our own cases would seem to prove this contention.

In cases associated with jaundice, operation can be carried out with less risk, if the abdominal wall is blocked with novocain, and ethylene used as the general anesthetic with as little ether as possible. In cases of deep jaundice it is usually best not to remove the gallbladder, unless it can be done with very little disturbance to the surface of the liver. If that is opened into, considerable oozing follows, and the more these cirrhotic livers are sutured, the more profuse the oozing becomes. The result is that the wound has to be closed with the gallbladder fossa packed with gauze, which is a bad procedure if it is possible to avoid it. It is essential to control all oozing when the patient is jaundiced.

From the investigation of all of these problems concerning hepatic function, the work that is being carried out enthusiastically by many investigators, from the work that is being done to facilitate a better conception of disease of the gallbladder and bile tract, and from the technical improvements (preparation of the patients for operation, and better after-care) much progress can be expected in the treatment of cholecystic disease, in spite of the fact that a few years ago it was often said that there was nothing more to be learned about gallbladder trouble.

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PATHOLOGY AND DIAGNOSIS OF CHOLECYSTITIS*

A. A. Matthews, M.D., F.A.C.S.
SPOKANE, WASH.

From the embryologic standpoint one would think the gallbladder had some very important part to play in one's general make-up, it being derived from a group of primitive cells which also give rise to the stomach, duodenum, liver and pancreas. Recently there has been some controversy in regard to the liver arising from these cells.

It is a peculiar thing that so many animals and birds with much the same habits are lacking in this organ; some of the common animals which do not have a gallbladder are the horse, ass, rat, pocket gopher, the deer. All that family of animals which shed their antlers yearly belong to this group.

When Shakespeare wrote Hamlet, it was known by him that the pigeon did not have a gallbladder. In his soliloquy the first player says:

> "But I am pigeon livered and lack gall
> To make oppression bitter." Act. II, 2, 605.

Occasionally embriologically the gallbladder system develops, as is the case in the lamphrey eel, which after existing for a while disappears. The same is also claimed of the pigeon and rat, but in the latter the gallbladder never develops.

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The mucous membrane of the gallbladder is covered with columnar epithelium; it is continuous through the hepatic duct with the mucous membrane lining the ducts of the liver and through the ductus communis choledochus with the mucous membrane of the duodenum. Mucous glands may be found in this coat, as well as diffuse lymphoid tissue and solitary follicles.

The mucosa is formed of tall, thin villus structures, intricate in their extensive branching and delicate in the supporting frame work of the stroma. It is so arranged to bring the contents into intimate contact with as much of the surface as possible, and the structure is well adapted for absorption purposes.

There are two sets of lymphatics in the gallbladder, a relatively poor one on the serous layer and a relatively large one under the serous coat, communicating freely with the lymphatics of the liver. The main ducts extend down the cystic duct and drain into the adjacent lymph glands. A study of the lymphatic system of the gallbladder and liver by Heyd[15] demonstrates that there is no barrier between the intra- and extrahepatic lymphatics, but the liver lymphatics pass unobstructed into the gallbladder and the lymphatics of the gallbladder pass directly into the liver substance through the arc of attachment of the gallbladder and liver. Lymphatic anastomosis between the gallbladder, liver, pancreas and appendix is very extensive, therefore the easy communication of infection from one to the other.

Meltzer has pointed out that certain species have their gallbladders imbedded into the liver substance, or they hang free from its surface and in some species are located some distance from the liver. The number and course of the bile ducts may vary greatly, while the bile may drain through the hepatic duct into the gallbladder and through the cystic duct into the duodenum, or various numbers of hepatic ducts may join the cystic duct to form a common duct. The hepatic duct may enter the duodenum directly or enter the cystic duct direct. The cystic duct may drain into the stomach.

The physiology of the gallbladder is a much mooted question. Only recently have physiologists concerned themselves in regard to this organ. Many textbooks of physiology do not mention the gallbladder, as Mann has stated it first became really known when it was found the surgeon could drain or remove it, and its position in the medical literature was assured when the internist found he could also drain it.

The bile in the gallbladder contains many more solids than that coming from the liver duct. Hohwieg claims that the gallbladder absorbs fluid from the bile and further claims that 40 c.c. of bile in the gallbladder represents from 240 to 400 c.c. of bile from the liver.

As far as I can learn, all physiologists are agreed that the gallbladder has great power of absorption, especially of water, and concentrating the bile. Rouse and McMaster claim that pigment concentration of the gallbladder bile is ten times greater than bile collected directly from the liver. Sweet believes that the absorption of the cholesterol is an important function of the gallbladder.

Hulbert[1] claims the cystic duct is a path to the gallbladder and the blood and lymphatics are the path from it. He further believes[2] that the gallbladder can reabsorb all the secretions from a healthy liver.

It is generally conceded that the gallbladder secretes mucus which lubricates the ducts, at the same time reduces the irritability of the bile and pancreatic secretions. The question has been raised that the gallbladder elaborates a special secretion or hormone, but this has not been definitely proven.

Many experiments have been carried on to determine the motility of the gallbladder. While there are differences of opinion, it is generally conceded that there is a rhythmic contraction, which is carried on during digestion and much influenced by the contents of the duodenum. This pressure has been estimated in dogs to vary between 216 and 340 mm. water pressure. The work of Metzler and Lyon, also Graham's cholecystograms and the methods used combinedly have surely definitely shown that the gallbladder contracts; also it can be regarded as a tension bulb to prevent back pressure on the liver and bile ducts.

I have never seen a gallbladder empty at operation or postmortem. This in itself is rather conclusive that it never entirely empties, and possibly on this ground Sweet made the statement that what goes into the gallbladder never comes out.

Surgery of the gallbladder seems unsettled in the minds of some, the question whether to drain or remove. A number of years ago the former was the operation of choice. In more recent years the latter is most generally accepted and the pendulum has swung far to this side, but now there seems to be a tendency of some to try and swing it back, retaining the gallbladder, unless there is positive gross pathology. It is my policy in recent years to do cholecystectomies in all cases that show any pathology.

In January, 1917,[4] I published an article reporting 105 consecutive gallbladder operations. Of this number 35 were cholecystectomies and 70 were cholecystotomies. Of the last hundred consecutive cases I did, 91 were cholecystectomies and nine cholecystotomies. This shows the great change in the two operations in regard to my individual work.

I have a number of cases under observation that I feel would be better off if I had removed their gallbladders, but at the time of operation there was no discernible pathology, therefore they were not removed. Their symptoms have continued and I have been unable to come to any other conclusion, except that they did have a cholecystitis which of course has continued.

With me now it seems not which gallbladder to remove, but which to leave. When a long distinct clinical history is given, all other conditions are eliminated and a normal appearing gallbladder is presented, I would be tempted to remove it and feel pretty convinced that under such conditions all should be removed. But bearing in mind, in order to obtain satisfactory results in any surgical procedure we must determine the basis for that procedure on the pathologic as well as the clinical evidence, and if an operation is performed from the clinical picture alone we may be led astray; it is well to recall the very unsatisfactory results obtained in certain gastric cases some years ago, when gastroenterostomies were often performed on symptoms and not upon definitely proven pathology.

Both clinical and experimental observations have shown that the removal of the gallbladder is followed by a compensatory dilatation and thickening of the extrahepatic ducts, with a later dilatation of the sphincter of Oddi, resulting in a continuous flow of bile into the duodenum. McMaster and Rous state no trouble is caused by the absence of the gallbladder, for the body adapts itself to the conditions, but this does not mean that it is without significance.

The only gallbladders to my mind which should be drained are in the cases where a more formidable procedure, such as cholecystectomy, is not warranted. My experience in cases of gallbladder drainage is that these patients as a whole are relieved for a while, but a large number later on develop trouble and require cholecystectomy. This is sometimes a difficult and serious procedure, as the gallbladder is often contracted down to a fibrous mass, adhesions dense, making it frequently a very formidable and dangerous operation.

Deaver[17] claims that 65 per cent of his recurrences could have been obviated by the removal of the gallbladder. From a general resume of forty-five of the most experienced American surgeons in regard to their experience with drainage of the gallbladder, it was found that nine and five-tenths had a recurrence of symptoms.[18]

There is no question in my mind that a gallbladder which has been subjected to a cholecystotomy is a liability rather than an asset. It can readily be seen that a patient is spared many years of ill health by removing a slightly infected gallbladder. Changes in the wall of the gallbladder so slight that they can only be detected by histologic examinations furnish a focus from which infection spreads to neighboring organs. This surely justifies a cholecystectomy. The persistency of symptoms after operation on the bile tract is due to continuance or recurrence of infection in the gallbladder, liver, ducts, pancreas or to overlooked or newly formed stones.

I have never seen harm come from the absence of the gallbladder, in spite of the theoretical objections that have been advanced against its removal. With very few exceptions the many cases of cholecystitis which I have observed have been promptly and definitely cured by the operative procedure, and never have I seen the slightest recognizable functional disturbance result from the loss of the gallbladder, even when this organ was not seriously diseased at the time of removal. Experiments[3] upon dogs show no change in the gastric juice after cholecystectomy.

Sweet has aptly put the present status of the gallbladder with that of the tonsils and the appendix, illustrating the fact that little consideration is given the possibility of the gallbladder having a physiologic role. C. H. Mayo states he thinks the gallbladder was in part a true gland which long ago might have had an important function to perform in protecting the body against certain foods or toxins, and is propably not so important at this time.

An interesting experiment has been carried on by Mann[14] with animals in which the common bile duct is ligated and the gallbladder intact. Bilirubin will not occur in the blood before twenty-four hours, and a definite positive test will not be present before thirty-six hours. When the common duct is ligated and gallbladder removed at the same time, bilirubin will appear in the plasma in from three to six hours, showing that the gallbladder has great storing property.

The Vandernbergh test for serum bile has transformed our outlook of jaundice from the sclera and skin, bile pigment in the urine and feces to the occurrence in the blood. Normally bilirubin in the blood serum is 0.3 to 0.5 parts to 200,000, while in visible jaundice the bilirubin in the serum has to be 4 or more parts to 200,000. So the detection of hyperbilirubinemia is of definite value in obscure diagnosis in which jaundice is considered. A definite scale to measure jaundice is, therefore, established.

Cholecystitis and cholelithiasis are the two common conditions we are most often called upon to treat. The thing we should consider first is the cause of the condition, so that its prevention to some degree may become possible.

Infection may be derived from any foci anywhere in the body, where it can gain access to the blood and then be disseminated to any part of the human anatomy, so that the primary foci should be removed. If this is not done, the recurrence of trouble in the gallbladder, liver and bile ducts may arise. The infection may find its way to the gallbladder through the alimentary canal, passing from the duodenum into the common duct through the portal circulation and thence descending with the bile through the lymphatics or by direct invasion from some neighboring organ, or by the direct blood supply.

While the gallbladder is seldom, if ever, alone involved, it is frequently the center of infection and the home for the organisms, where they are apparently dormant during the intermission between attacks. But most probably there is an unnoticed progress taking place, for after all the gallbladder may be completely destroyed by the disease with not a great degree of discomfort to the patient.

The most common organism found in cholecystitis, according to Moynihan[6] is the B. coli, while Rosenow[8] is of the opinion that the streptococcus is the more prevalent. It is not unusual to find cultures from the gallbladder to be sterile, but by culturing its wall the organism may be grown.

Gallbladder infection, next to appendicitis, is the most frequent of all abdominal infections. In some classes of people, notably the obese middle aged multipara, it is more frequent than appendicitis. It is the second greatest cause of chronic indigestion. Inflammation of the gallbladder may develop during the first and second decades, but as the local symptoms are obtrusive the condition usually escapes recognition. After middle age the local symptoms predominate and the diagnosis of gallbladder disease is then made. We have been accustomed to associating the condition as being a disease of middle age or advanced life.

Babcock[5] considers surgery as working for the most part far behind the pathology of the disease, and believes that there is a wide need for earlier intervention, so the individual, starting at the age of twelve or fifteen with cholecystitis and dyspepsia, may not at thirty-five have gallstone colic and may not at sixty-five succumb to a cholecystectomy, gangrene or pancreatitis. While this statement seems rather radical, as there is nothing definite to support the conclusions that lassitude, mallaise, biliousness in young people are due to hepatitis and are cured by the removal of the gallbladder, yet it sounds plausible and is probably correct in many cases.

Clinically[7] nearly every case of cholecystitis is associated with a hepatitis and oftentimes with a pancreatitis, although the degree of involvement may be so slight as not to be diagnosable clinically. The actual pathology of the early infection has been well described by McCarthy. The pathologic condition is a progressive one. It is one of the principal factors which under cholecystic disease makes it important for early recognitioin, for apparently the gallbladder once infected never returns to normal.

Deaver[11] states that the liver is the original distributor of the infection and the lymphatics are the avenues by which it is carried to the gallbladder, and the early pathologic lesions usually found are in the liver cells, which may vary from mild cloudy swelling to fatty degeneration and even focal necrosis. In brief, the liver tissue of the gallbladder bed is never without involvement, when the gallbladder is diseased. May not, then, the gallbladder have its starting point in the liver in certain cases, and if so, is not the symptomatology of early gallbladder pathology practically the symptomatology of low grade hepatitis. When cholecystitis is recognized early it is a surgical condition, which is not today accepted by many of the medical men; therefore, these cases do not reach the surgeon until late manifestations have arisen.

Under certain conditions one may have to open the gallbladder and take a section from its wall for immediate microscopic examination, but according to Judd this has not proven satisfactory. Occasionally upon opening, very small stones are found which are not palpable through the gallbladder wall. Again, we find the typical strawberry gallbladder, characterized by small, whitish elevated deposits, in the mucosa of an ester of cholesterol, which lipoid substance, when sufficiently deposited as to be discernable by the naked eye, has a fanciful resemblance to the strawberry seed. The fish scale gallbladder is due to lipoid substance, piled up in the structure of the wall, principally in the mucosa.

Following cholecystitis, in most instances comes a stone stage. This is a process which develops usually slowly, with many possibly very mild and recurrent attacks of inflammation, increased quantity of mucus, bile salts, bacteria and stasis, with an increased quantity of cholesterin or calcium. Why one should predominate in one case and the other in another, I have been unable to elicit. It is interesting to know that the typhoid organism has been grown from the center of gallstones removed thirty-five years after the patient had enteric fever (Finney).

Purely mechanical stasis does not lead to stone formation, but functional stasis does. In comparing women and men in regard to the presence of gallstone the ratio is about 4 to 1 and this is supposed to be due to the increased cholesterin, especially during pregnancy, and a certain amount of stasis in the gallbladder produced by tumors, pregnancy, tight lacing, lack of exercise, etc.

There is a condition, in which a gallstone can be found in the gallbladder without infection, that is, in hypercholesterolemia. These stones are single, composed of pure cholesterin and give no symptoms unless causing mechanical disturbance, or an infection becomes ingrafted. They are usually round or egg-shaped, translucent with a warty-like surface, and are somewhat amber in color. It is considered that the removal of the stone in these cases is sufficient, but I have resorted to cholecystectomy in the few that I have had.

Hypercholesterolemia can definitely be determined by the blood examination and is found in excess in arteriosclerosis, chronic nephritis, diabetes, latter months of pregnancy, as well as in cholelithiasis. The normal cholesterol content of the blood is 0.160 per cent.

The x-ray has come to the front as a great assistance, and often gives direct evidence. By this I mean when stones are definitely shown, when the gallbladder is clearly visible on the ordinary x-ray plate. With this direct evidence must be classed the splendid work of Graham and his associates. The indirect evidence is the pressure evidence of the gallbladder upon the stomach or duodenum, or the traction effect due to adhesions to the neighboring viscera.

There is a wide variance of opinion among radiologists as to the percentage of gallbladders which will show, but it is quite safe to say that the x-ray is of no help in making a diagnosis in more than 40 per cent. With the newer method of Graham, his cholecystograms will greatly increase our ability in making these diagnoses. I saw a recent article, where a well known radiologist was claiming 90 to 95 per cent diagnosis in gallbladder disease by this method.[9] It has not as yet been thoroughly standardized, and is not on an absolutely practical basis.

In February, 1924, Graham, Cole and Copher published an article, showing that the gallbladder could be x-rayed almost as clearly as the stomach after taking of barium, and this was done by using tetrobromphenolphthalein sodium salt intravenously. This discovery has been accepted most enthusiastically by all radiologists throughout the world.

On account of the severe reaction sometimes occurring from the intravenous administration of the bromine preparation, they changed to the tetraiodophenolphthalein, with less toxicity but not free from reaction. Then the duodenal tube was resorted to with fair success but much discomfort to the patient, often causing nausea and vomiting. Then were used coated pills or capsules by mouth, which are not supposed to dissolve until they reach the intestine. This was followed by fair success with less reaction, but the accuracy of this method is questionable, as there are many considerations to be contended with. I rather feel the mouth route cannot ever be entirely satisfactory, as the absorption coefficient varies in each individual. The intravenous method will eventually be the ideal way, after the many details of technic are cleared up. The drug is eliminated by the liver and passes through the hepatic and cystic duct to the gallbladder which it fills and casts a faint shadow in four hours, which will decrease in size and become more dense in eight hours; in twelve hours the gallbladder will be about the same density but smaller, and within twenty-four to thirty hours the shadow will have disappeared.[15]

Moore[19] claims the total absence of shadow is a more reliable indication of a diseased organ than its examination as carried out at operation. Gallbladders giving no shadows and apparently normal at operation have been found on incision not only to be diseased but to contain stones. The Graham method should be regarded as a functional test for the gallbladder.

The clinical history is so splendidly given by Moynihan, that I take the privilege of quoting:

> "The diagnosis of cholelithiasis does not, as a rule, present much difficulty, for the formation of stones in the gallbladder, and those attempts at migration which cause hepatic colic are terminal events. Cholecystitis precedes cholelithiasis in all cases except those in which the solitary cholesterin stone is present. Our endeavor should be to recognize the presence of the infected gallbladder before the stones have had time to form. The symptoms to which I drew special attention as 'inaugural' are amply sufficient to indicate the existence of cholecystitis. They are symptoms referred by the patient to the stomach.
>
> "The complaints are of a fullness, weight, distension or oppression in the epigastrium, coming as a rule within half or three-quarters of an hour after meals, relieved by belching and dismissed almost on the instant of vomiting. These sensations are elicited with remarkable constancy by certain articles of diet, especially those containing greasy or acid material. There is a sensation of tightness which, if unrelieved, may become acutely painful; by it the patient is made restless, and from it he obtains relief by bending the body forwards, by flexing the right thigh on the abdomen, or by loosening all garments which press upon the waist.
>
> "There is often a complaint of acidity or heartburn, and in the act of belching there may be bitter and acid regurgitation. Many patients notice that quite suddenly there may be a great gush of saliva into the mouth. While discomforts last there may be a 'catch in the breath.' When a deep forced breath is taken, an acute stabbing pain may be felt on the right side, of such severity, that the act of respiration is suddenly checked. Faintness, nausea, sweating of the face and neck, and a sense of great prostration may be followed by vomiting. There may be a slight sensation of chilliness and shivering, especially in the evenings; 'goose-flesh' is mentioned repeatedly in the clinical histories as a very disagreeable experience. Upon all these symptoms, which may exist for years, a series of attacks of colic may be imposed. Our efforts, however, should now be directed to the recognition of the precalculous stage of the disease."

Whatever diagnostic aids are utilized, however, in certain cases these should include all the means at one's command. It should be emphasized, as in the diagnosis of other diseases, that final dependence must be placed upon clinical judgment. In certain cases, despite the most painstaking examination, the x-ray and clinical analysis, and even despite direct inspection, the correct interpretation is not made. The one final criterion is the result (Crile).

As to the diagnostic value of Lyon's method, I agree with Fitz[6] that it seems doubtful whether much diagnostic significance can be attached to the clinical study of cases, to similar analysis of bile, the specimens of which are collected through the duodenal tube at best by an indirect route, from an undetermined source in the bile tract. I cannot see how it is possible that this method of treating cholecystitis can have any curative effect upon the infected wall of the gallbladder.

The physical examination in the early cases is often of a negative character, much the same as in ulcer of stomach and duodenum. Sometimes a tenderness may be elicited or rigidity in the upper right quadrant of the abdomen. By placing the patient in a sitting position on the edge of the examining table, having him take a deep breath and let it out quickly, the examiner standing behind using his right hand, passing his fingers firmly up under the right costal border, will often elicit a soreness or tenderness in gallbladder infections.

Cholecystectomy is the ideal operation for any infection or disease of the gallbladder. The technic I will not go into, for it is well established and known to us all, with its many possible complications and dangers associated with the procedure.

The rule that I follow, when first opening the abdomen, is to inspect the gallbladder as to its color. The normal should be a blue green. This should be done before handling, then palpate to determine its flexibility and thickness of its walls; note if there is a deposit of fat along its blood vessels; palpate for enlarged glands along the cystic duct; note if there are adhesions to the neighboring organs; gently squeeze to see if it empties; express enough bile so that the wall of the gallbladder can be brought in contact, so if stones are present they can be felt; examine the liver and see if it is darker or rough; note the acute angles and border and see if they are more rounding than normal. Very often there is a noticeable cirrhotic area on the upper surface of the liver, just over the gallbladder and radiating lines run out from the gallbladder, indicating a change in the liver substance and lymphatics involvement, therefore making it seem that the liver is a primarily involved organ in some cases. All of these conditions are the result of infection.

The question of drainage following cholecystectomy has been batted back and forth by various writers. I have always had a feeling that it is safer to drain, using a small folded rubber or penrose drain down to but not in contact with the cystic duct. I always tie the cystic duct with soft gut, allowing the ends of the ligature to come through the belly wall, which will come away or are absorbed in a few days. These ligature ends act as a guide to the cystic duct, if such is needed, also as a sexton to the outside. The drain is removed from twenty-four to forty-eight hours.

I am well versed in the articles against draining by Wetzel, Hobern, Wills, Richter, Stetton and others but cannot convince myself that it is the safer plan. The form of drainage spoken of does no harm, does not delay union, promotes ultimate healing, does not produce or induce hernia and is of decided value, if there should be considerable oozing and much bile drainage either from the liver or cystic duct. The early removal of the rubber drain is not a factor in symptoms producing adhesions.

Prolonged jaundice greatly increases the risk of operation, by interfering with the function of the liver and kidneys and by increasing the tendency for hemorrhage, not alone from the operation but from the mucus membranes. The clotting index of the blood does not always give a true index of this ability. Some patients with a short clotting time will bleed severely, while others with long clotting time bleed but little. The free drinking of alkaline waters and the giving of calcium chloride intravenously is a great help, but the greatest protection to be had is transfusion of blood done before operation, consequently before the onset of bleeding.

The operation upon the deeply jaundiced patient is a very serious problem, and we have two conditions to face: first, the hepatic insufficiency, and its avoidance if such is possible; second, postoperative hemorrhage. The symptoms of liver failure are likely to come on unexpectedly and often the patient is apparently doing well, when suddenly we are faced with the clinical picture which is so well described by Walters and Parham[12] as follows:

> "Usually the first two to eight days after operation the course is uneventful; biliary drainage and urinary output are normal, fluids are taken well, the pulse and temperature are normal. One of the first signs of the onset of trouble is paling and thinning of the bile, with marked increase in the flow. This profuse cholerrhagia does not continue long, but the bile remains thin. The patient begins to grow weaker, the pulse loses volume, and the temperature becomes subnormal. Restlessness and irritability develop, with great fatigue and muscular weakness. Soon regurgitant vomiting follows intake of liquids by mouth and little taken by rectum is retained. Jaundice does not deepen markedly, but there is an increasing pallor beneath the icteric hue, the face becomes drawn, and the eyes anxious. The patient grows progressively weaker and finally dies. The urinary output remains proportional to the fluid intake throughout and the urine reveals little or no evidence of marked nephritis. The blood urea remains persistently low."

I wish to acknowledge the splendid articles on gallbladder by Sir Berkeley Moynihan, J. B. Deaver and F. C. Mann, whom I have taken the privilege of quoting.

SUMMARY

1. Embryologically it is peculiar that some animals, with much the same habits as those with gallbladder, lack one.

2. The mucous membrane of the gallbladder is especially well constructed and arranged for absorption.

3. The lymphatic system of the gallbladder is very extensive and intimately connected with that of the liver, pancreas and appendix.

4. The comparative anatomy shows many different locations of the gallbladder in certain species, also the irregularity of the ducts.

5. The physiology of the gallbladder is not definitely settled in many respects.

6. Gallbladder bile is much more concentrated than liver bile.

7. Gallbladder has a contractile power much influenced by the duodenum content, also a mucous secretion.

8. Cholecystectomy is operation of choice in all gallbladder diseases and never has any functional disturbance ever arisen from its absence, there being a compensatory dilatation of the extrahepatic ducts following its removal.

9. Hyperbilirubinemia can definitely be detected early by a blood examination.

10. Cholecystitis precedes cholelithiasis and often hepatitis precedes cholecystitis. Cholecystitis is practically always associated with hepatitis and often with pancreatitis.

11. Cultures of gallbladder contents are often negative but organisms can be grown from gallbladder wall. B. coli and streptococcus are most common organisms.

12. Pure cholestrol stone may occur in gallbladder without infection.

13. X-ray is great aid in diagnosis, since the Graham method has been established.

14. Clinical history is most important and considerable dependence should be placed upon it. Direct inspection and close observation of local conditions are important in making diagnosis.

15. Drainage following cholecystectomy is a safer and more sane procedure.

16. Jaundice increases hazard of operation many fold. There is danger of failure of liver function and hemorrhage.

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DIAGNOSIS OF CHOLECYSTITIS AND CHOLELITHIASIS*

David J. Lawson, M.D.
PORTLAND, ORE.

While attending the surgery clinics during my medical school course, I have been impressed with the number of gallbladder operations, in which no gross pathology could be found even after the surgeon had exposed the organ. The symptoms had been highly suggestive in each case and the question of the advisability of removal was difficult to decide.

Gallbladder lesions are the most frequent cause of gastrointestinal motor disturbances. Blackford[1] found that 20 per cent of 1,650 cases with gastrointestinal symptoms were due to cholecystitis. The relative frequency of abdominal organic disease causing dyspepsia in his series was gastric ulcer, one; gastric carcinoma, two; reflex appendicitis, four; duodenal ulcer, six; gallbladder disease, twelve. Considering the relative frequency of gallbladder lesions among the conditions causing dyspepsia, it seemed to me gallbladder conditions should be more accurately diagnosed, and with this in mind I have attempted to thoroughly investigate the subject.

As a basis for my study I reviewed some fifty cases with proved operative diagnoses of cholelithiasis. These patients had been operated upon at Emanuel Hospital, Portland, during the years 1922, 1923 and 1924.

Since a thorough clinical study of the patient is of first importance, as is emphasized by Gaithers[2] of Baltimore and others, I shall first consider this aspect of the problem. Several predisposing etiologic factors are of importance. Women are affected more than men, 7 to 1, at Emanuel. Blalock[3] reports two-thirds of those operated on for biliary disease at Johns Hopkins Hospital, in which there are twice as many males admited in the surgical service as females; while Alvarez[4] reports 5/12 per cent of all women coming to necropsy as having gallstones and in those over fifty years a higher percentage. This probably is due to the lack of exercise and sedentary habits of women. Toxopeus[5] states that in all cases there is a lack of exercise of the diaphragm. Thus the costal breathing due to tight clothing plays its part. Most of the women in the cases reviewed had borne children. Mayo[6] states that 90 per cent of married women who have gallstones have been pregnant and that 90 per cent identify the beginning of their symptoms with some particular pregnancy.

The average age incidence is between 45 and 50 years, few occurring before 35 and the disease being rare in childhood.

A history of typhoid fver was obtained in about 8 per cent. Blalock[2] reports 28 per cent between 1889 and 1924 in Johns Hopkins Hospital. The rarity of typhoid in recent years probably accounts for the difference. However, in many cases a history of an acute infection, especially streptococcic is present, though many gallstones are formed from cholesterol without bacteria being present.

The following signs and symptoms were found in the cases reviewed:

	Per Cent
Abdominal pain (most frequently sharp and lancinating)	98
Radiation of the pain	24
Jaundice	30

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* Graduation Thesis, Department of Surgery, University of Oregon Medical School, Portland, Oregon, June, 1925.

Tenderness	78
Nausea	58
Rigidity (upper right rectus)	34
Vomiting	52
Itching skin	4
Constipation	46
Chills and fever	32
Clay colored stools	8
Eructations of gas	46

These symptoms were complained of in the histories at one time or another during the attacks.

Blalock[2] gives the following individual symptoms as having been present at one time or another:

	Per Cent
Pain	96
Radiation of pain	51
Indigestion	86
Nausea	76
Vomiting	73
Constipation	62
Eructation of gas	59
Chills and fever	62
Jaundice	55
Itching of the skin	13

These cases were diagnosed as biliary tract disease but were not all proved so by operation. In the Johns Hopkins Hospital cases 82 per cent had intervals of almost entire freedom from symptoms. Radiation occurred almost twice as frequently in cases with stones and was usually to the right shoulder or right back, although in some instances it extended to both shoulders.

The habitual eating of fatty and greasy foods and large meals seemed to be often associated with the indigestion accompanying gallstones, though usually the pain had no time relation to the meals, often coming on at night and causing sleeplessness and fatigue. This pain and indigestion varied from time to time in the same patients and also varied in different patients, resembling renal colic, typical ulcer (gastric or duodenal), appendicitis or any other abdominal cause of dyspepsia. This is due to the close relation of the abdominal organs through their reflex nervous mechanism and, as pointed out by Alvarez[7] in his study of the mesenteric reflex, the presence of abnormal irritants in the intestines causes reversed peristalsis, rushing gas, bile and even food back into the stomach.

The insufficient and abnormal bile for proper digestion and lubrication in the bowel is easily cause enough for such reversed peristalsis with resulting gas eructation, nausea and vomiting, as well as for the epigastric pain or symptoms of the typical so-called ulcer histories which are quite common. Another frequent cause for such gastrointestinal symptoms is adhesions. In several cases reviewed these gave every symptom of cholecystitis, but on operation no pathology other than adhesions could be found. The constipation which so frequently was found is doubtless related to the abnormal bile and inadequate lubrication of the bowel.

Jaundice, especially if persistent, was usually due to stones of the common duct, 80 per cent of these cases being jaundiced. Itching of the skin was associated with the jaundice if it occurred.

The physical examination should be complete. Tenderness was usually present and Murphy's sign of inhibited inspiration on pressure under the costal margin was most effective in localizing this over the gallbladder. Tumor masses were not common, being present in only about 8 per cent of the cases. Cheney[8] states that these are due almost entirely to a blocked cystic duct with fluid accumulation, acute infection with pus formation or to carcinoma.

After reviewing the principal points in the histories and physical findings, it can be said that they are valuable as suggestive evidence in the diagnosis of gallbladder conditions, but are not proof even when typical, and consequently for absolute evidence we must look elsewhere. The usual laboratory work should be done. The presence of bile in the urine, especially in the presence of typical history and physical findings, is of course highly suggestive. The blood count is slightly increased in the usual cases rarely, running high. In cases of pernicious anemia, in which gallstones are generally found, it is complicated by the blood changes of this disease. Jones and Joyce[9] found gallstones in each of thirteen cases of pernicious anemia on which they operated. Gastric analysis often shows achlorhydria, according to most writers, Blalock[2] giving 23 per cent out of 206 cases examined. Stool examinations may be of assistance if bile is absent, as is rarely the case.

Turning now to the special laboratory methods, bile aspiration with a needle, the Lyon-Meltzer test, cholecystography by the method of Graham and Cole, x-ray alone, and the Fouchet test for cholecytitis, we will consider each briefly.

Aspiration of bile with a thin needle has been used but does not seem very helpful except in determining the presence of pus. The bile aspiration is surprisingly normal according to Alvarez,[4] even in advanced cases. The bacterial cultures in these cases is negative, while normal bile is probably rarely sterile.

Possibly no laboratory method of diagnosis has been discussed so much in the last few years as has the Lyon-Meltzer test. In 1917 Meltzer[10] first proposed the law of contrary innervation of the smooth muscle of the sphincter of the gallduct and that of the gallbladder. He concluded from his experiments that magnesium sulphate relaxed the sphincters and caused contraction of the gallbladder. Lyon[11] in 1919 took up the work and developed the present system of instillation of magnesium sulphate, 25 per cent into the duodenum through a duodenal tube and the removal of bile at different intervals. These samples were supposed to be derived from the common duct, gallbladder and hepatic ducts, and were called bile "A," "B" and "C." The first sample was of a golden yellow, the second a dark green, and the third a golden yellow color again, the dark bile coming supposedly from the gallbladder. Studies of this bile were then made. It was cultured, examined microscopically for crystals and for abnormalities in composition as well as quantity. The method was quickly taken up over the entire country and found many adherents. Within the last year or two, however, criticism has increased until now there is little left that has not been entirely discredited as a diagnostic measure.

First, Meltzer's theorem of contrary innervation was discredited. It was found by other physiologists that sodium sulphate, sodium phosphate, hydrochloric acid and peptones cause a flow of bile, while most of them do not cause relaxation of the sphincter or smooth muscle of the papilla. Alvarez[4] was able only to stimulate the gallbladder to contract sufficiently barely to overcome the pressure in the common duct and valve of Heister in the cystic duct. At meal times the gallbladder empties slowly, probably due to the decreased pressure in the ducts. Diamond,[12] experimenting on dogs with duodenal fistula, repeatedly injected intraduodenally magnesium sulphate solution in ambulatory animals without the expulsion into the duodenum of carmine previously introduced into the gallbladder. Alvarez[4] injected methylene blue into the gallbladder but was unable to obtain it in the bile, using the Lyon-Meltzer technic, even though the dark "B" bile appeared. He also reports using the method and obtaining the dark "B" bile with a patient on whom an operation was performed the next day, and the cystic duct was found to be obstructed with a stone and the gallbladder full of pus and blood. This evidence seems to be conclusive proof that the law of contrary innervation is incorrect and also that magnesium sulphate cannot cause contractions of sufficient strength to cause emptying of the gallbladder. Nor does the dark "B" bile come from it alone.

Lately the work of Matsuo[13] of Japan has again brought the question to the fore. Under local anesthesia, thus avoiding the abolition of physiologic reflexes brought about by a general anesthetic, he has operated on gallbladders, and while the bladder was exposed, instilled the magnesium sulphate into the duodenum. He claims the organ quickly diminished in size to about one-fourth the original. He then injected 40 c.c. of 1 per cent azorubin S solution into the gallbladder. During this procedure the bile from the duodenal tube contained no azorubin S. Forty c.c. of 33 per cent magnesium sulphate was then instilled through the tube. Again the gallbladder contracted and this time the dye was obtained in the tube. These results were obtained in two cases but they have not, so far as I am able to learn, been corroborated by other workers.

Boardman[14] of San Francisco has made probably the most comprehensive study of the bacteriologic findings in the Lyon-Meltzer test. He used Lyon's technic of attempted sterilization of the mouth, teeth, tonsils and stomach with potassium permanganate (4 grains to the ounce), followed by zinc chloride, using also Lavore's astringent solution in the stomach and rewashing. In the first place, he was unable to sterilize the mouth, cultures being the same before and after attempted sterilization, due to the continual secretion of saliva and mucus. Second, saliva is continually swallowed and reaches the stomach. Thus, powdered charcoal on the patient's tongue was recovered in bile samples from the duodenum in 56 cases. The tube used had a gelatine covered tip to prevent contamination in the stomach if possible. Third, in the 56 cases studied, the fasting duodenal content "B" and "C" bile gave the same cultures in 46 to 69 per cent of the cases and the various bile samples were similar to those of the mouth or stomach in 74 to 86 per cent.

In conclusion, Boardman states "no reliance could be placed on the bacteriologic findings in the various bile samples and that even with the most painstaking technic, the procedure is bacteriologically so fundamentally faulty that its use in routine clinical study of the duodenal biliary zone is apt to lead to more incorrect than correct conclusions."

The fact remains, however, that magnesium sulphate causes an increased flow of bile and Jones[15] finds that the bile does differ from normal in nearly all cases of cholelithiases. Characteristic bile sediments are obtained and he feels that the method can be used in differentiaiting cholelithiasis from uncomplicated cholecystitis. He also found increased bile pigments in cases of functional disturbance of the liver which cannot be discussed here, although liver disturbances are frequently associated with cholecystitis and cholelithiasis. Jones' sediments are obtained by high speed centrifugalization of the duodenal content. The increased characteristic sediments of cholelithiasis consist of bile stained epithelium or leukocytes, and cholesterin, bilirubin, or calcium bilirubin crystals. For the Lyon-Meltzer test we can say that in certain cases it may be added to our other laboratory procedures, but that it gives but little or no diagnostic proof of gallbladder disease. As a therapeutic measure in nonsurgical cases it may be of greater value.

The Fouchet test for hyperbile rubinemia should be mentioned. Garvin's[16] report on this test makes it a very questionable diagnostic adjunct in cases of cholecystitis. He finds that of 86 cases of gallbladder disease only 17 per cent gave a positive reaction. Four of these gave but faint reactions, while six more, in whom the reactions were positive, were so frankly jaundiced that no refined test was necessary to demonstrate hyperbilirubinemia.

The most definite proof of cholelithiasis is an x-ray shadow. Unfortunately this is obtained in less than half the cases even by the best men. Carmen[17] and his associates reported roentgen-ray study of 2,500 cases. He was able to demonstrate gallbladder disease in only 45 per cent of those considered pathologic at operation. He demonstrated stones in 38 per cent of 266 cases, in which stones were found at operation. However, with proper technic and experienced men, positive shadows can be considered as proof of gallbladder disease. Its value is thus in the positive rather than in the negative findings. X-ray work should include roentgen-rays of the stomach, duodenum following a barium meal and also of the large bowel after giving the barium enema. By this means the other conditions most likely to cause the gastric symptoms associated with cholecystitis can be eliminated to a large degree.

In connection with the x-ray, cholecystography, with the method of Graham, Cole and Copher,[19] must be considered. These men made a comprehensive study of the different substances eliminated in the bile through the liver and which gave definite shadows with the x-ray. At first they found that the sodium salt of tetrabromphenolphthalein in pure crystaline form seemed to give the best shadows with fewer unpleasant reactions. Since, however, they have obtained a pure form of the sodium salt of tetraiodophenolphthalein, which has the advantage of being no more toxic in equal doses and gives equally good cholecystograms in much smaller doses than with the sodium tetrabromphenolphthalein. A dose of 0.2 gm. per kilogram of body weight of either salt produces no lesions in the liver or other parenchymatous organs. The lethal dose in dogs of 0.27 gm. per kilogram of body weight was found to be the same for both drugs. The dose used of the tetraiodophenolphthalein to obtain satisfactory shadows was only 0.53 gm. per kilogram of body weight which gives a safe margin in the use of the salt. The reactions following its use, such as dizziness, nausea, vomiting and backache which occurred now and then in using the bromide salt, were distinctly less marked and fewer in number.

The technic used is as follows: 3 to 3.5 gm. of sodium tetraiodophenolphthalein or 5 gm. of sodium tetrabromphenolphthalein for persons weighing 60 kilograms (130 pounds) or over is dissolved in 40 c.c. of distilled water and sterilized in boiling water for 15 minutes. The solution is given intravenously with a syringe in two doses one-half hour apart, before breakfast between 7:30 and 9 a.m. Care should be taken not to allow extravasation into the extravascular tissue, on account of the danger of tissue necrosis. In a few patients this may be followed by transitory reactions, chief of which is a fall in blood pressure which, however, has always been relieved promptly and permanently by administering 0.5 to 1 c.c. of epinephrin intramuscularly. Certain essential orders for the patient were given:

1. Breakfast should be omitted.
2. Lunch should be omitted (one glass of milk may be given).
3. Protein should be omitted from the evening meal.
4. While awake the patient should take 2 gm. of sodium bicarbonate every three hours for forty-eight hours.
5. Water may be taken by mouth.
6. The patient should lie on the right side of the abdomen.

Roentgenograms are taken four, eight, twenty-four and thirty-two hours after injection. The contraindications for the method are:

1. Common duct obstruction.
2. Heart disease.
3. Advanced arteriosclerosis.

The normal shadows are homogenous and pear shaped.

The abnormal shadows as given by Winslow[19] are several:

1. Faint or wholly absent shadows.
2. Delay in filling or emptying.
3. Deformities in contour.
4. Unvarying size and mottling.

Stones, tumors or inspissated bile may prevent filling and filling defects. Cirrhosis of the liver or hepatitis also prevents filling, but then the liver shadow is absent.

The following technic in making the roentgenograms was used in Graham's work. "A radiator coolidge tube is used with duplitized films under double intensifying screens. The smallest practical diaphragm is used, and compression is made with the cone on the patient, who lies on his abdomen on the table. A flash exposure is made, a 60 milliampere current spark gap varies with the thickness of the patient. The Buckey diaphragm is not used."

By this method Graham and his associates claim to have made a correct diagnosis with sodium tetrabromphenolphthalein in 95 per cent of the cases of cholecystitis, with or without stones, which were verified by operation and pathologic examination of the gallbladder. Using the sodium tetriodophenolphthalein,[20] they obtained 92.5 per cent in 55 cases. Winslow[19] reports a correct diagnosis in 96 per cent of 25 proved cases. These reports are highly satisfactory, but the method is new and as yet it cannot be considered, probably, as a means of positive proof of the presence of cholecystitis. However, when used as a means of verifying positive x-ray shadows or even in negative roentgenograms which are also negative for gastrointestinal lesions, it certainly is proof enough to warrant an operation.

In conclusion, it may be said that in the diagnosis of cholecystitis:

1. A careful clinical study of the patient is of first importance, but no history or physical findings are absolute proof of the presence of disease of the gallbladder.

2. The usual blood and urine examinations should be done routinely.

3. The Lyon-Meltzer test, unless done in conjunction with the gastric analysis, is not of sufficient diagnostic value to compensate for the discomfort and inconvenience to the patients. However, in doubtful cases it should be part of the routine diagnostic procedures.

4. In the roentgen-ray and cholecystograms by Graham's method we find the most definite proof of gallbladder lesions and in using them in conjunction, the evidence necessary for operation can be obtained.

5. The above diagnostic measures are not perfect or entirely conclusive, but close adherence to them should, I think, greatly increase the percentage of correct gallbladder diagnoses.

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SUBCAPITAL FRACTURE OF NECK OF FEMUR. Armitage Whitman, New York (*Journal A. M. A.*, March 27, 1926), reports two cases in support of the thesis that subcapital fracture of the neck of the femur may unite under one form of treatment. Whitman points out that if open operation is ever to be recommended as an immediate remedy for such fractures, bone grafting operations are no more free from the element of risk than the abduction treatment itself. In his cases the abduction treatment led to perfect anatomic and functional recovery and apparently firm bony union.

THE GALLBLADDER IN GENERAL*

WITH A CONSIDERATION OF THE SODIUM TETRAIODOPHENOLPHTHALEIN TEST IN PARTICULAR

Wayne J. Stater, M.D.
PORTLAND, ORE.

The embryology of the gallbladder has been studied in only a limited number of animals. In certain animals it never develops, for example the rat. In others, the pigeon may be taken as an example, the gallbladder develops normally only to disappear without functioning. Still another type exists, of which the petromyzon may be taken as an example, in which a complete biliary system develops and persists for a time, only to degenerate later.

The gallbladder, liver, and extrahepatic biliary passages are entodermal in origin. It has been considered that the gallbladder is formed from the group of cells which give origin to the liver, duodenum, and pancreas, rather than from the same group of cells which give origin to the liver. In general the entodermal portion of the liver, gallbladder and extrahepatic biliary passages arise as a diverticulum from the ventral wall of the foregut. This diverticulum pushes out into the lower division of a mass of mesoderm, the septum transversum, the upper part of which forms the diaphragm, the lower portion the ventral mesentery. Later anastomosing cords of cells grow out from the hepatic diverticulum to form the liver cells but maintain a connection with the diverticulum which later forms the hepatic duct. The gallbladder, which joins the main hepatic duct by means of the cystic duct, is a special subdivision of the original diverticulum. The common bile duct thus formed is an elongated portion of the original hepatic diverticulum. The wall of the gallbladder, that is, the connective tissue and the smooth muscle cells, is derived from the mesenchyme, the peritoneum and blood vessels from the mesoderm, while the nervous tissue comes from the ectoderm.

Histologically the gallbladder is divided into layers. The mucous membrane is made up of tall columnar epithelium with basal nuclei and secretory granules on the lumen side. The cells are similar to those lining the gastrointestinal tract but goblet cells and glands are not usually found. The mucous membrane is thrown up into folds which allows a greater area for absorption or secretion. Luschka described gland-like structures in the mucosa but these are probably not true glands. Beneath the mucosa one finds a fibromuscular layer which is made up of smooth muscle and connective tissue. No definite arrangement of the smooth muscle tissue has been demonstrated. This layer contains the larger lymphatic channels which are especially abundant in the connective tissue that lies next to the mucosa. One finds two types of nervous tissue here. One supplies the blood vessels and the other, consisting of sympathetic ganglia and fibers, supplies the smooth muscle cells. An occasional solitary lymph follicle is found beneath the mucosa. The subserous layer is made up of fairly dense elastic tissue. This layer contains the larger blood vessels.

The blood supply of the gallbladder comes from two sources, the cystic artery and from the liver to a less extent. The serous layer which does not completely surround the gallbladder is made up of the typical cells which form the peritoneum. Certain peculiarities of the cystic duct have received considerable attention. In many animals it is quite tortuous. Anatomists have described a sphincter about the duct. Heister described folds in the cystic duct which he thought acted as valves. The difficulty of emptying the gallbladder by pressure is thus explained on an anatomic basis.

The anatomy of the gallbladder is so well understood that only the anatomic anomalies of the biliary vessels and ducts will be considered. The variations of the ducts and vessels are of great importance on account of the accidents which may occur during cholecystectomy or choledochostomy as a result of their too frequent occurrence. The most important anatomic anomaly is the variations in the course and mode of union of the cystic and hepatic ducts.

Normally, in about 70 per cent of the cases, the cystic duct unites with the main hepatic duct at an acute angle. In 1896 Poirier made the observation that the terminal portion to the cystic duct is bound down to the main hepatic duct by a layer of strong connective tissue for a distance of about two centimeters. The parallel type of union of the cystic and hepatic ducts occurs in about 17 per cent of the cases. This type has been subdivided into two groups, the long and short parallel types. In the short parallel type the two ducts run parallel to the upper border of the duodenum, while in the long parallel type the parallelism persists to within about 0.5 cm. of the ampulla of Vater. In both instances both ducts are held together by dense strands of connective tissue.

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The second most important variation, the spiral type, occurs in about 8 per cent of the cases. This type is subdivided into the anterior and posterior varieties. The cystic duct, instead of emptying into the hepatic duct on the right side of the latter, winds around it, one-fourth, one-half, three-quarters, or indeed a full turn, either anteriorly or posteriorly before union occurs. A stone in the cystic duct of either the parallel or spiral types of union of the cystic and hepatic ducts may compress the common duct, simulating common duct stone. Or, if the cystic duct be ligated high, the lower portion may dilate to form a new gallbladder.

We may present a table here which shows the frequency of the different types of union of the cystic and hepatic ducts, as found by the limited number of workers in this field, taken from Eisendrath.

	Normal Angular		Parallel		Spiral	
	No.	per cent	No.	per cent	No.	per cent
Ruge (43 cases).....	14	33	12	29	16	38
Kunze (39 cases)....	20	51	19	49	....	....
Descomps (50 cases . .	40	80	6	12	4	8
Eisendrath (100 cases)	75	75	17	17	8	8

Variations of the hepatic ducts are less common but the right hepatic duct may empty into the gallbladder or cystic duct. An accessory hepatic duct is more common. It may empty into the right hepatic duct, at the point of junction of right and left hepatic ducts, into the main hepatic duct or into the cystic duct.

Two other variations of the cystic duct and gallbladder are responsible for accidents during cholecystectomy. A very short cystic duct may cause the main hepatic duct to be drawn out of its course and resected. When the pelvis of the gallbladder is on the upper side and firmly adherent to the hepatic duct, the wall of the duct may be injured during the removal of this portion of the gallbladder.

Just as the variations of the bile ducts are responsible for accidents in gallbladder surgery, so are the anatomic anomalies of the blood vessels. The variations in the relation of the right artery to the main hepatic duct are perhaps the most important. The normal course, which occurs in only about 70 per cent of individuals, finds the right hepatic artery beneath the main hepatic duct, where it gives off the cystic artery as it reaches the right edge of the duct. On account of this arrangement it is best to ligate the cystic artery close to the neck of the gallbladder, for the main hepatic duct may be included in the grasp of forceps, if the stump of the cystic artery retracts.

The two outstanding anomalies of the right hepatic artery are where (a) the right hepatic artery runs parallel to the cystic duct, (b) the right hepatic artery arches far beyond the right border of the main hepatic duct or the artery may form a ring about the duct. These anomalies occur in almost 20 per cent of individuals. In about 12 per cent the right hepatic artery crosses in front of the main hepatic duct and then gives origin to the cystic artery. Several important variations of the gastroduodenal artery occur, but these are especially important in operations on the common duct.

The cystic artery shows many variations. It is a single structure in 88 per cent of cases, double in about 12 per cent. The normal origin of the cystic artery has been described. In about 5 per cent of cases the cystic artery may arise from the left hepatic artery, main hepatic artery, or from the gastroduodenal and cross the common duct obliquely to reach the neck of the gallbladder. When two cystic arteries are present, they have the following origins: (a) both arise from the right hepatic, (b) one arises from the right hepatic and one from the gastroduodenal, (c) one arises from the right hepatic and one from the main hepatic, (d) both arise from the left hepatic.

Numerous theories have been advanced to explain the functions of the gallbladder but the exact role of this organ has not been elucidated, although it must perform a valuable function in modern life. According to the reservoir theory the gallbladder acts as a reservoir for the bile secreted during the intervals between feeding. Following a meal bile passes into the intestines about as fast as it is secreted. The capacity of the normal gallbladder is only about 30 c.c., so that it canot act as a reservoir like the urinary bladder. Unlike the urinary bladder the gallbladder has an absorptive power which increases its storage capacity, but the detrusor muscle of the urinary bladder finds no exact counterpart in the gallbladder.

Each theory may state a portion of the facts. The gallbladder does have the power of absorption and this leads to the absorption theory. It has not been clearly demonstrated whether absorption means only concentration of the contents of the gallbladder or is a specific affair. The abundant lymphatics, the folded character of the mucous membrane and movements of the gallbladder point toward an important absorptive function. The greater concentration of bile and the halogen phenolphthaleins in the gallbladder than in the ducts, of course, is positive evidence.

The pressure regulation theory states that the gallbladder acts as an expansible chamber, regulating the pressure in the biliary passages. The most common cause of changes in intrabiliary duct pressure is the respiratory movements. Any change in intrabdominal pressure may affect biliary tract pressure. Changes in intraductal pressure depends more or less on the rate of bile secretion and whether the outlet of the common duct is open or closed. According to the secretory theory the gallbladder adds something to its contents besides mucus, but the histologic structure of the cells of the mucosa does not support this view.

Finally, the gallbladder may regulate the flow of bile into the intestines. The liver is continually secreting bile but the gallbladder has a marked absorptive power, so that the bile flow into the intestines need not be continuous.

Surgery of the gallbladder and ducts shows that the organisms compensate the loss of the gallbladder by a dilatation of the extrahepatic biliary tract and continuous duodenal discharge for a time.

Experimentally Man and Bollman made a comparison between the development of jaundice following obstruction of the common duct with the gallbladder intact and when the gallbladder had been removed. They found in animals in which the common bile duct is obstructed but with an intact gallbladder that bilirubin does not appear in the plasma before twenty-four hours, usually thirty-six hours, but if the cystic duct is ligated or the gallbladder removed at the same time that the common duct is ligated, bilirubin appears in the plasma very much earlier, after three hours occasionally, and always after six to eight hours. This difference in the rate of development of jaundice is due to the concentrating function of the gallbladder as pointed out by Rous and McMaster.

Experiences with cholecystography have shown us that the gallbladder normally empties itself after the ingestion of food, particularly fats. The presentation of a test meal at the proper interval after oral or intravenous administration of sodium tetraiodophenolphthalein makes it possible to study the physiologic movements of the gallbladder undisturbed by operative procedure. The effects of different kinds of foods, drugs, etc., on the cholecystic shadow will in time be visualized. The gallbladder reflex has received considerable attention but its presence has not been proved. According to this theory there is a reciprocal action between the gallbladder and the sphincter of Oddi. When the gallbladder contracts, the sphincter relaxes.

Bacteriologic studies of the bile, wall of the gallbladder, and the center of gallstones have usually shown staphylococci, streptococci, colon or typhoid bacilli, when organisms are demonstrable. Most observers have found a negative more often than a positive culture. Bacteria have been demonstrated in the bile and not in the gallbladder wall and vice versa. Many years ago Cushing cultured typhoid bacilli from the center of gallstones.

The normal gallbladder is blue and has a capacity of about 30 c.c., although this varies somewhat. Certain evidence indicates that pathologic changes may be present without gross changes in the external appearance of the gallbladder. By inspection and palpation a variety of changes may be noted in the pathologic gallbladder, as variations in color, size and consistency, irregularity in outline or position, adhesions to contiguous viscera, etc. Stones may or may not be palpable. Tapping the gallbladder, and excision of small piece of gallbladder wall for microscopic examination, although not generally practiced, may occasionally be indicated. Enlarged lymph glands may be palpated along the ducts.

On opening the gallbladder the wall may be found thickened and cut with increased resistance, the bile altered. The mucosa may show various retrograde changes or the esters of cholesterol deposited in the wall, due to a metabolic disorder, may be in sufficient quantities to give it the characteristic strawberry appearance. Microscopically the usual signs of inflammation are found. In the acute cases there may be necrosis and ulceration of the mucosa, diffuse infiltration of the wall with leukocytes, congestion of the blood vessels, diapedesis of red blood cells, edema, etc. In the chronic cases retrograde changes to necrosis and ulceration of the mucosa may persist. The mucosa may be thrown up into long folds and be bound together by connective tissue. In an attempt at repair the remaining epithelium often produces gland-like structures which may be found deep in the wall. The wall is usually thickened and inelastic as a result of scar tissue formation. Infiltration with leukocytes of various varieties is found, depending upon the stage of inflammation. The leukocytes often contain bile pigment.

The relation of gallbladder disease and hepatitis, choledochitis, appendicitis, common duct stone, biliary cirrhosis of the liver, peritonitis and pancreatitis need only be mentioned. The gallbladder may act as a focus of infection and may have some relation to certain cardiac diseases and glycosuria.

The signs and symptoms of gallbladder diseases, elucidated by means of the history and the results of inspection, palpation and percussion, present an accuracy in diagnosis of about 70 per cent. Beck noticed in 1900 that gallstones could be visualized upon x-ray films but experience has shown that the percentage visible by x-ray examination is only about 50 per cent. When shadows of the gallbladder itself were visualized on x-ray films and indirect evidences of cholecystic disease were found during roentgenologic visualization of the gastrointestinal tract, further advances were thought to have been made but experience with these methods has found them wanting.

Cholecystography, which was originated by Graham and Cole, has increased the accuracy of diagnosis in this field to about 95 per cent. This is an offshoot of the discovery by Abel and Rowntree that the liver secretes the halogen phenolphthaleins. Graham and Cole found tetraiodophenolphthalein too toxic for clinical use and first recommended calcium tetrabromphenolphthalein but, on account of its relative insolubility, sodium tetrabromphenolphthalein was adopted for intravenous injections. In a comparative study of the two salts, sodium tetrabromphenolphthalein and sodium tetraiodophenolphthalein. Whitaker and Milliken demonstrated that the toxicity was about the same but on account of the atomic weight of iodine and the greater proportion of it in the salt the iodine salt is about twice as opaque to the roentgen rays as the bromine salt. Moreover, the dose of the iodine salt need only be one-half that of the bromine salt.

Two methods of administration of the salt have been worked out, the intravenous method recommended by Graham and Cole, and the oral method which was developed by Whitaker. The intravenous method, although quite safe, requires a more exacting technic, demands more of the patient's time, produces more severe reactions than the oral method which is more generally applicable, since it can be used in ambulatory patients. Sodium tetraiodophenolphthalein is the most desirable substance to use in the preparation of cholecystograms, whether the intravenous or oral method be used.

If the intravenous method be used, 0.04 grams of the iodine salt per kilogram of body weight is administered slowly into a vein after the proper solution is prepared. If the solution escapes into the subcutaneous tissues necrosis may result. No food is given for six hours before and ten hours afterward. The first roentgenogram is made ten hours after injection, with the usual gallbladder technic. If a satisfactory cholecystogram is obtained, food containing fat is given and a roentgenogram repeated in one hour. If the original shadow is clearly outlined, oval, and of uniform consistence and is reduced in size after the test meal, no additional x-rays are taken. The gallbladder is considered normal. On the other hand, further plates may be necessary to clarify the picture.

If the oral method is used, one stearic acid coated pill (5 grains 0.03 gms.) of sodium tetraiodophenolphthalein is given for each ten pounds (4.5 kilograms) of body weight in stout patients up to twenty pills. In thin patients one pill for each 12-15 pounds (5.4 to 6.8 kilograms) of body weight is administered. Two hours after a light supper four pills are taken with water each half hour, until the full dose is consumed. The patient lies on the right side. No cathartic or food is given until the first x-ray film is made by the usual roentgenologic technic for gallbladder work, about sixteen hours later. If a normal shadow results, a test meal containing fat is given and the roentgenogram repeated one hour later. If the gallbladder is reduced in size, no further work is done, and the gallbladder is considered normal. On the other hand, it may be necessary to take additional films.

Normally the cholecystogram is of uniform density, oval or pear-shaped, and diminishes in size after giving a test meal containing fat. It will vary somewhat in size and position. Failure of the gallbladder to fill with the salt is perhaps the most important sign and indicates obstruction of the cystic duct, usually by stone but also by swollen mucous membrane, adhesions, thickened bile, new growths of the galltract itself or of other structures which by pressure involve the influx of bile to the gallbladder, etc. In advanced cirrhosis of the liver or markedly impaired hepatic function from other causes gallbladder filling may be interfered with.

Almost of equal importance is the determination of contractility or elasticity of the gallbladder on presentation of the test meal. If it fails to diminish in size after a test meal or if the shadow persists for an abnormal length of time the gallbladder is probably pathologic. On the other hand, a gallbladder containing stones may contract normally. Mottling of the cholecystic shadow usually indicates stones, papillomata or gas in the intestines, but the mottling does not persist in the latter. An irregularity in the outline of the gallbladder is usually due to inflammatory changes in the gallbladder itself but occasionally in contiguous organs with resultant adhesions.

The application of cholecystography for diagnosis of cholecystic diseases has not only increased our diagnostic accuracy but has also made possible the study of the gallbladder in its normal physiologic relations, undisturbed by anesthesia and manipulation. Already the effects of some food elements on the shadow have been determined, and the effect of drugs, etc., will in time be unfolded.

The treatment of gallbladder disease is surgical. Medical drainage by the Meltzer-Lyons method has not been encouraging. The causes of death after operation on the gallbladder and ducts are usually due to hemorrhage, hepatic or renal insufficiency which often run hand in hand, and infections of the bile ducts. These complications are usually the result of a chronic jaundice as a result of obstruction of the common duct, and do not occur frequently when the pathology is limited to the gallbladder.

The hemorrhage which may occur in jaundiced patients is usually controllable by the intravenous administration of 5 c.c. of a ten per cent solution of calcium chloride on three consecutive days just preceding operative interference. In this way the clotting time of the blood can usually be brought to normal. If this method fails, blood transfusion should be resorted to before operation.

Cholecystectomy has largely supplanted cholecystostomy, although the latter is indicated in certain instances. The superiority of cholecystectomy over cholecystostomy can best be pointed out by a consideration of the bacteriology and especially the pathologic physiology of the diseased gallbladder. Cultures of the gallbladder wall will sometimes yield a positive culture when the bile is sterile, so that drainage of the lumen of the gallbladder may leave a chronic focus of infection in the wall with probable recrudescence of the inflammatory process later. The concentrating function of the gallbladder is certainly interfered with, when the mucosa is involved and the wall greatly thickened by an increase of connective tissue which no doubt squeezes out many of the lymphatics when it contracts. Some absorption probably continues and many bacteria are undoubtedly carried outside the gallbladder by this route. Again, the increase of connective tissue in the gallbladder wall must interfere with its elasticity. Clinical experience favors cholecystectomy.

Of the two methods of performing cholecystectomy, the operation beginning at the cystic duct and working outward is generally used, but that of beginning at the fundus and working toward the ducts is often safer, when the recognition of anatomic landmarks is difficult. In any case, the cystic duct and artery should be identified as well as the main bile radicals and large blood vessels which are closely associated with them. There is considerable danger of injuring the main blood vessels and ducts, especially on account of the frequency of anatomic anomalies in this region.

A portion of the peritoneal covering of the gallbladder should be preserved to act as a covering for the raw gallbladder bed. In certain benign obstructions of the common duct the gallbladder should not be sacrificed, as it may be necessary to do a cholecystgastrostomy or cholecystduodenostomy in order to sidetrack the bile into the intestines. Drainage is unnecessary in a large percentage of cases. Clinical experience and bacteriologic studies support this view. When there is any doubt, a drain should be inserted.

364 Pittock Block.

FACTORS OF SAFETY IN GALLBLADDER AND DUCT SURGERY*

Paul Rockey, M.D., F.A.C.S.
PORTLAND, ORE.

In the consideration of factors of safety in gallbladder and duct surgery, the first question is whether to operate. There is no difference of opinion regarding cases with clear cut and generally recognized indications. Of these, where operation is indicated, even the most grave are properly accorded the beneficial chance of operation. The question of whether to operate is debated in doubtful cases, where the diagnosis is obscure. In the light of present knowledge it seems to me that operation should be decided on in such doubtful cases only after complete examination, observation and consideration. Then, if indication is sufficient, but diagnosis is only probable, the operation is admittedly but justifiably exploratory. The question of whether indication is sufficient in such cases depends not only on the sum of our present knowledge of the whole subject, but also on the personal equation of the surgeon, his character and temperament.

When the gallbladder region is exposed at operation, certain cases still remain doubtful, the doubt depending on what constitutes pathology and its significance. At times it is difficult to recognize pathology, for example, to palpate small stones. Adequate exploration must presuppose sufficient incision, retraction, careful palpation, inspection and consideration. One must examine the liver. One must inspect and palpate the gallbladder wall. One must examine adhesions, if present, and the bile ducts, head of pancreas and lymph nodes, as well as stomach, duodenum and colon, usually appendix, sometimes right kidney, and sometimes pelvic and other intraabdominal viscera. So far, knowledge has not reached the heights sometimes attained by hope and supposition. In the writer's opinion, where careful exploration still leaves sufficient doubt, it is better practice to close without further operative procedure than to perform a gallbladder operation, probably cholecystectomy, on insufficient grounds. It is assumed that the indications of preoperative investigation are given due weight in making the surgeon's decision, as well as the possibility of slight appearance of really important pathology, which would justify cholecystectomy.

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* Read at Thirteenth Annual Meeting of North Pacific Surgical Association, Portland, Ore., Dec. 12, 1924.

A pathologic report on an excised gallbladder merely stating chronic cholecystitis is practically meaningless, as much so as a similar report of chronic appendicitis. In doubtful cases only real meaning could be had from a consideration of the anteoperative investigation, the gross pathology at operation, and the gross and microscopic pathology of the excised gallbladder as reported by a competent pathologist, and a careful consideration of all the future course of the case. In some of these cases all this is still inadequate, because of limitation of our present knowledge.

Adhesions of the gallbladder wall and in that neighborhood are frequent. Some are probably congenital, as such adhesions are reported in autopsies on newborn infants. Many are the result of inflammation, and of these the origin and significance of some is uncertain or unknown. In many cases of adhesions there is uncertainty, not only as to cause and significance but as to whether they are doing harm, and whether symptoms supposedly due to them will be relieved by their division or removal.

Unquestioned gallbladder pathology is sometimes encountered incidentally at operation performed for other indication. Under these circumstances the margin of safety is sometimes wide enough, and the indications sufficiently urgent to justify dealing with the gallbladder pathology then, but often it is not. Other things being equal, multiple operations are undesirable. Then it is better to complete the intended operation, record the incidental findings relative to the gallbladder pathology, and deal with it at subsequent operation according to the nature of the findings, the history and further course of the case. The same general rule applies to other pathology encountered at gallbladder operations.

In cases where it is properly decided to operate, the next question is when to operate. Many cases not in exacerbation are operations of election as to time within obvious limits. With stones in the gallbladder it is safer to operate before inflammatory changes have become more marked, and before a stone may have been forced into the common duct. Where an attack, particularly a recurrent attack of obstructive jaundice, is subsiding, it is better to wait further clearing of the jaundice. Where obstructive jaundice is not lessening, it is better not to wait. Where there is sufficient presumption of threatened gangrene or perforation of the gallbladder, operation should be proceeded with at once, as of course when these misfortunes have taken place.

With icterus index determinations being made satisfactorily, an additional aid will be afforded in the consideration of doubtful cases, where jaundice is slight or invisible. Such determinations of the degree of bile in the blood will be of practical value in cases of obvious jaundice, where is is desired to determine whether the jaundice is clearing and how rapidly.

When liver function tests are sufficiently improved, we will have another help in the study of all these cases. There are, as surgeons have reported, cases with apparent adequate margin of safety that prove postoperatively to have very narrow margin of safety as regards the functional adequacy of the liver. Liver function tests will safeguard patients by the anteoperative recognition of such cases.

The anteoperative preparation, so far as time and the patient's condition permit, is designed to promote safety not only as to general considerations of stomach, intestine, fluid supply, etc., but particular considerations such as delayed coagulation and bleeding time. In the presence of jaundice with marked delayed coagulation and bleeding time, I think the transfusion of unmodified blood by the Kimpton method is most reliable. Where the indication is marked, this should be done before operation. Otherwise, a suitable donor having been secured, it can be done if indicated at any time after operation. Many times when considered, the course proves it unnecessary. The additional or alternative methods of increasing coagulability may be considered.

Assuming the character of the anesthetic to be excellent, the kind of anesthetic is of great importance. Many gallbladder and duct operations are performed within a wide margin of probable safety, and the usual anteoperative hypodermic, generally of 1/6 of a grain of morphine, and 1/150 of a grain of atropine, three-quarters of an hour before operation, is followed by gas-oxygen-ether anesthesia with entire satisfaction and good result. But in many cases the margin of probable safety is narrow, sometimes very narrow, and in these cases local anesthesia should be used. We use novocaine, generally a half per cent, although a quarter per cent is satisfactory. We do not use adrenalin with it. We always have the anesthetist present, ready to use gas, and meanwhile to watch the patient and talk to him. Many times no general anesthetic is needed.

The position of the patient at operation is of distnict importance. It is our custom to use a foot piece on the table, and to elevate the head of the table about 20 degrees. We raise the gallbladder rest four or five inches. It should be lowered before the wound is closed. Rarely it is better to lower the rest, at least temporarily, to improve the patient's condition. In some cases, especially very weak patients under local anesthesia, the rest need not be raised.

We use a vertical, right rectus or right paramedian incision, the distance to the right of the midline depending on the size and proportions of the patient and any special factors in the case. In proportion as the case is one in wider limits of safety, we are inclined to incise the anterior sheath of the rectus, and retract the rectus outward. This incision can be extended as needed. Generally it should be of ample length. In closing the incision, the rest having been lowered, the edges of the incision in the posterior sheath and peritoneum are caught with hemostats. A long, double No. 2 plain suture is started continuously from the lower angle of the wound. A similar No. 2 chromic suture is started at the lower angle of the anterior sheath incision. By continuing these upward together it is found that the wound is more quickly and easily closed. The chromic suture is then reinforced with interrupted sutures of single No. 2 chromic, and the skin closed with interrupted silk worm.

The dressing is gauze, with or without pad, and adhesive, adequate to maintain the dressing and support the wall, but not tight enough to cause discomfort or functional embarrassment. A binder is often not applied at this time, but is generally used in convalescence. If drainage is used, we generally bring it out at or near the upper angle of the wound, occasionally through a stab wound external to the operative incision. We always anchor drains with silkworm sutures through the skin, and tubes that project through the dressing to the adhesive plaster.

According to the condition of the patient, the kind of case and the pathology encountered, exploration may be required to a slight or complete extent. Unquestionably in some cases an operation with least disturbance is indicated. Insofar as exploration and careful identification of certain structures are needed, an important factor of safety is time and care for this purpose. Every surgeon now knows about the possible variations in form and relations of the cystic and hepatic arteries, cystic and hepatic and common ducts, and of the possible further modification of these by inflammation. Only requisite time and care are needed to apply this knowledge for the safety of the patient. Identification here should be under sight. Great care is sometimes needed to find stones when present, or to find all stones. Again time and care are needed for the patient's safety.

In manipulation about the foramen of Winslow and the common duct, evidences of a sudden fall in the patient's blood pressure are sometimes noted. Gentleness of manipulation and retraction is always possible without sacrifice of time or mechanical efficiency. Advantage is often gained by an assistant holding up the liver edge, and care will prevent tearing the liver.

It is not for me to attempt an answer to the subject of cholecystectomy versus cholecystostomy, but I may offer some comments, considering the patient's safety as it seems to me. Other things being equal, I think a pathologic gallbladder should be removed. Where a gallbladder, containing stones or not, is obviously pathologic and likely in future to remain so, and to have no function or impaired function; is causing important symptoms now and likely to cause trouble in future; where there is no sufficient contraindication to its removal, either in the patient's general condition, in especial local difficulties, or in the immediate or probable future need of the gallbladder, as for cholecystoduodenostomy, it seems that the patient's safety is best conserved by its removal. This is well within the limit of prevailing practice. As suggested before, where interference is not adequately warranted, I think the gallbladder should be left alone. The indications for cholecystostomy as I see them are the remaining ones. The decision depends on the judgment of the surgeon at the time of operation. Behind that judgment and constituting it are knowledge, experience, recognition of pathology and an appreciation of the present and probable future condition and course of the patient.

If cholecystectomy is performed, as I have said, it is important to identify structures. I cannot say I think one should always remove the gallbladder from the cystic duct or from the fundus. Providing it is carefully done, in the manner of the operating surgeon's choice, I do not think it matters so far as the patient's safety is concerned. It is our custom to double ligate the stump of the cystic duct with No. 2 chromic catgut. It is often feasible, and I think desirable, to leave a sufficient peritoneal border to sew over the gallbladder bed on the under surface of the liver, but not always so. I think it is never a necessity and postoperative experience has surely shown that the omission of this procedure is not harmful.

I do not propose a complete answer to the question of whether one should or should not drain after cholecystectomy. In our own practice I have seen no harm from not draining. We know that occasionally unfortunate results occur, due to lack of such drainage. On the other hand, I have not seen harm from drainage. I think it is not proved that drainage is more likely to cause disturbing adhesions. We have thought at times that drainage invited bile leakage. But I am not sure of this, for even if bile does not leak from the stump of the cystic duct, it may leak from the gallbladder bed or from a severed accessory bile duct, as has been reported. The greater the probability of bleeding, biliary leakage or exudative inflammatory reaction in any given case, the more indication for drainage after cholecystectomy.

From what has been said it follows that cholecystostomy is generally performed in cases more difficult and complicated, and in patients with a narrow present and future margin. One drains these cases with the rubber tube from the gallbladder. Whether he drains in addition with drain of any type depends on the indications in the surgeon's judgment.

Without common duct obstruction, external biliary drainage is not likely to be unduly prolonged nor an important tax on the patient, but with common duct obstruction the opposite is true. Cholecystoduodenostomy may be performed at a second operation, and sometimes this should be done. There are cases where the probability of its being required suggests the advisability of cholecystoduodenostomy at the first operation, providing that in the judgment of the surgeon the patient's condition warrants the procedure. The postoperative course of a case with cholecystoduodenostomy is easier; usually, where indicated, it can be done at the first operation.

Of course, in carcinoma of the head of the pancreas, causing obstructive jaundice, cholecystoduodenostomy is the operation of choice. There are cases, some at primary and some at secondary operation, with complete common duct obstruction, where it is safer to perform a cholecystoduodenostomy, even if the obstruction is not carcinoma of the head of the pancreas, rather than to spend time and the patient's strength in further effort in determining and directly relieving the obstruction. Where cholecystoduodenostomy is likely to be needed, the gallbladder should not be removed.

In all cases of obstructive jaundice beware of removing the gallbladder. If this has already happened, choledochoenterostomy of some sort is the necessary alternative. For mechanical convenience and to save time, it is sometimes safer to anastomose the gallbladder or a bile duct to the stomach instead of to the duodenum which is the place of choice. I think it safer to place a drain to the region of the anastomosis in all these cases.

The common duct must be opened at times for stone, exploration or drainage. Such incision should be in the line of the duct. It is necessary to remember possible anatomic variations, as well as pathologic ones. Sometimes it is better to open the lower portion transduodenally. I have not seen harm come from this procedure. I think occasionally aspiration of the common duct for identification before opening is a wise precaution. After the common duct has been opened, it may be partially or completely sutured, or not. I think it is practically always sufficient to place a drain to an opening in the common duct, but I think some type of drain should always be so placed, even though that opening has been completely sutured. It is our custom to use No. 0 or No. 00 chromic catgut to suture the common duct. Where the hepatic or common ducts are accidentally injured, the literature shows, as one would expect, that it is very desirable that the injury be recognized and dealt with at once.

Usually it is desirable to explore and remove the appendix in gallbladder cases, where it has not been previously removed, but sometimes the pathology about the gallbladder or the patient's condition make it inadvisable to remove the appendix or even to explore it.

In mentioning postoperative treatment, it is our custom to have the patient's bed horizontal, and the patient on his back or right side. If long continued external bile drainage occurs with complete obstruction, it may be best to feed the patient his own bile, or to give him bile salts. If biliary secretion appears to be low and not increased by feeding, I think bile salts should be given. Where external bile drainage is provided for by tube, it is desirable to guard against stoppage of the tube by kinking or accidental pulling out of the tube. After discharge from the hospital it would be better if every gallbladder and gallduct postoperative case remained under the observation of a physician.

NOTE: (March 12, 1926.) The writer does not desire at this time to make any change in the foregoing paper but to add this note.

The first and one of the greatest problems in gallbladder surgery remains whether to operate. It is my impression that in prevailing practice the danger is not so much of failing to operate on cases, whose best interests require it, as in operating on insufficient evidence or on inadequate considerations on cases not needing operation. Common examples of this are those in whom symptoms are due, not to gallbladder pathology but to pathology or disordered function elsewhere, as in stomach and intestines, and those whose symptoms are supposed to be due to focal infection in the gallbladder. The obvious answer is the need of sound judgment, careful examination, consideration, observation and medical treatment anteoperative.

More aid is constantly obtainable from good radiographic examination; on the one hand, radiographic gastrointestinal study, on the other, radiographic gallbladder study. A valuable part of the latter is the use of sodium tetraiodophenolphthalein, giving important evidence as to filling and emptying time, size and change of size, and presence and position of calculi.

In the matter of icterus index determination, Dr. C. H. Manlove, pathologist of the Good Samaritan Hospital, recommends the method of estimating bilirubinemia of Van den Bergh.

There is still no complete and final answer to the question of what to do with certain stone-containing, but slightly pathologic or grossly nonpathologic gallbladders that could be removed, whether they should be removed, drained or sutured, and the abdomen closed with or without drainage.

MASSIVE INTRAPERITONEAL HEMORRHAGE. When Louis E. Phaneuf, Boston (*Journal A. M. A.*, March 27, 1926), first saw this patient, the clinical picture was that of an ovarian tumor, ascites and intestinal obstruction. A severe hemorrhage was not suspected. The state of shock was ascribed to the obstruction, while the anemic condition of the patient was thought to be due to malignancy and cachexia. When the abdomen was opened there was a gush of fresh blood. The abdomen contained about 2 liters of fluid and clotted blood. The pelvic peritoneum and the small and large intestines were markedly distended, and were covered with numerous white tubercles suggesting malignant disease. A large ovarian cyst with papillary projections was removed. The patient made a surprisingly good recovery, and her constant improvement since the operation gives the hope that she may be classed in the group of cases in which the secondary peritoneal involvement disappears after the removal of the primary tumor.

CHOLECYSTITIS AND DIABETES*

A STUDY IN THE ETIOLOGY OF DIABETES.

PRELIMINARY REPORT

LEO RICEN, B.S., M.D.
PORTLAND, ORE.

From the Department of Pathology, University of Oregon Medical School

It is generally accepted today, that the usual cause of diabetes is a pancreatitis.[1, 2] There is also sufficient evidence accumulated in support of the commonly held view, that cholecystitis is the most frequent cause of pancreatitis. This being the case, one would naturally expect that cholecystitis might also be a potent factor in the causation of diabetes. The fact that drainage or removal of an infected gallbladder, when associated with diabetes, resulted either in an apparent cure or great improvement of the diabetes, is particularly interesting, and is frequently quoted by those who hold that cholecystitis is a common cause of diabetes. It is the study of the etiologic significance of cholecystitis in the production of diabetes that forms the subject matter of this paper.

A review of the literature shows that Lancreaux,[3] in 1899, was probably the first to call attention to the intimate relation between the infected gallbladder and pancreatitis, and inferentially diabetes mellitus.

In 1910 Mayo Robson[4] proved that in cases of cholecystitis with glycosuria he could effect a permanent disappearance of the glycosuria by draining the infected gallbladder.

In 1913 the late John B. Murphy[5] called attention to the fact, that in cholecystitis associated with diabetes the glycosuria can be made to disappear by draining the infected gallbladder. The case reported by him in his "Clinics" was discussed by Mix,[6] who made the following statement: "We believe that in this case the diagnosis of cholecystitis is very much supported by the presence of glycosuria. We are of the opinion that this gallbladder should be drained, and that drainage is going to reduce materially the glycosuria, if not absolutely cure the diabetes. We do not believe it utopian to say that long continued drainage will cure the case." Six weeks after the operation the patient, whose urine showed nearly seven per cent of glucose before the operation, was entirely free of diabetic symptoms, and in spite of a fairly good allowance of carbohydrates, his urine showed barely a trace of sugar. Murphy, who discussed the case from a surgical point of view, called attention to the pancreatitis which was present in this case and which he firmly believed was the result of the cholecystitis. He took occasion to make the general statement that cholecystitis was a frequent cause of pancreatitis.

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* Read before the staff of Emanuel Hospital, Portland, Ore., Feb. 9, 1926.

These interesting observations on the etiology of diabetes did not seem to have attracted much attention at the time. It is possible that the attention of the profession at that time was diverted from the study of the relationship between cholecystitis and diabetes by the fact that the monumental work of Allen[7] appeared in 1913, soon after the publication of Robson's and Murphy's ideas.

Allen's first work gave the profession hope for a cure of diabetes, since he did not hesitate to make the following statement: "It is believed that a cure for diabetes is now a feasible experimental problem." As time went on the limitations of Allen's undernutrition treatment became apparent. Even the improvements upon Allen's treatment, introduced by Woodyatt,[8] which placed the therapeutics of diabetes upon an almost scientific basis, do not cure diabetes. I say "almost scientific" because no treatment can be called truly scientific, where there is no knowledge of the exact cause of the disease.

It is not sufficient to say that in diabetes we have found a fatigued function of the islands of Langerhans. Two questions must be answered: (1) What causes the islands to become fatigued in that class of diabetics who have been moderate eaters, and whose islands of Langerhans have not been subjected to any undue strain from excess of food; and (2) in those patients, who have been guilty of overeating, is the excess of food the only cause of their diabetes, or are there any other factors more important than overeating that perhaps play a greater role in the causation of diabetes than mere excess of food? In other words, a more comprehensive and thorough going study of the etiology of diabetes had to be carried out.

Nearly ten years elapsed from the time Robson and Murphy expressed their ideas on the subject of the causative relation between cholecystitis and diabetes, before it was revived by Eustis,[9] in 1923. In a paper entitled, "The Relationship of Gallbladder Disease to Diabetes," this author expressed his belief that infection of the gallbladder and of the common duct extends to the pancreas and causes inflammatory changes in it, which may eventually lead to development of diabetes. He reports a number of interesting cases in support of his theory.

In 1923 three more authors published their observations on the etiologic significance of the infected gallbladder in the causation of diabetes: Rabinovitch, Harris and Sir Gilbert Barling.

Rabinovitch,[10] having made a biometric study of the incidence of diabetes mellitus in diseases of the gallbladder and its passages, arrived at the conclusion that a causative relationship is demonstrated between the two. A routine examination of the blood sugars of the patients in the Montreal General Hospital, who presented symptoms of cholelithiasis, showed that in over eighty per cent of all such cases a hyperglycemia was found, though not of a sufficient degree to produce glycosuria.

Harris[11] expressed his belief that "a pancreatitis is often secondary to gallbladder disease, and that a preceding pancreatitis, from which results permanent damage to the islands of Langerhans that secrete the hormone, now called insulin, is usually the direct or predisposing cause of diabetes." In other words, he thought that cholecystitis stands in causal relationship to diabetes. Allen,[12] in discussing Harris' paper, stated that surgical removal of infected foci, including the infected gallbladder, is desirable for either prophylaxis or treatment of diabetes, admitting thereby that an etiologic relationship between an infected gallbladder and diabetes does exist.

Barling[13] believes that the dominating factor in practically all cases of pancreatitis is infection from the biliary passages. If this is true, then the infection of the biliary passages is also responsible for the development of diabetes, as according to Heiberg,[14] "when a chronic pancreatitis is present, diabetes will make its appearance sooner or later."

Heyd and Killian,[15] writing in 1924, stated that "many cases of gallbladder disease show a definite increase in blood sugar. In fact, a blood sugar as high as 200 mg. per 100 c.c. is not uncommon. However, following adequate surgical therapy for the disease of gallbladder or biliary ducts, the blood sugar readjusts itself to normal."

In 1924, Lichty and Woods,[16] writing on the significance of glycosuria in gallbladder and duct diseases, express their conviction that the frequent association of gallbladder disease with diabetes is not merely a matter of chance, but that the two stand in a causal relationship. They report three cases that were apparently cured of their diabetes, as a result of an operation upon the biliary tract.

In 1925, Jones[17] and his coworkers, after having studied the pancreatic and hepatic activities in diabetes mellitus, arrived at the conclusion that "in adults cholecystitis is probably one of the most important etiologic factors in diabetes mellitus."

Recently Adams[18] expressed his view on the etiologic importance of cholecystitis in the causation of diabetes by saying: "Often persons forty years of age or more are obese and usually have some arteriosclerosis; these factors plus an infected gallbladder may suffice to throw the balance in favor of mild diabetes." I am not concerned with age as a factor in the etiology of diabetes, since age is something that cannot be averted, whereas infection can be prevented or checked, and if infection of the gallbladder is a cause of diabetes, we have something tangible and definite to work on. As to the obesity of the middle aged being a factor in the causation of diabetes, our knowledge is far from being complete.

I agree with Palmer[19] that obesity is so commonly found in women past the menopause, and in men past forty, even when they are moderate eaters, in other words, where there is no extra strain thrown upon the pancreas, that I cannot consider it an etiologic factor in that disease. But I agree with Mitchell[20] that "there is no evidence that either overeating or obesity is the primary cause of diabetes." I am also in accord with Mosenthal,[21] when he says: "No relation except an empirical one has been formulated as existing between obesity and diabetes mellitus." Beeler and Fitz[22] subjected a number of obese nondiabetics to a glucose tolerance test and found that their blood sugar curves were practically the same as those of normal weight.

Strouse and Dye[23] have the following to say regarding obesity: "Both overeating and underexercise are common faults of mankind, yet excessive obesity is comparatively rare. On the other hand, one sees a fairly large number of healthy but thin persons, whose food intake is in excess of their calculated calorie requirements, yet who cannot gain weight under any circumstance." As a result of their experimental work, they were led to the following conclusion: "The data thus accumulated definitely prove that certain types of obese persons maintain their weight without regard to the usually accepted calorie balance."

In view of the just quoted facts, we cannot attribute much significance to obesity as a cause of diabetes, although Joslin,[24] Paullin and Sauls[25] and others consider it an important factor.

It is important that I should also make reference to the great benefit derived from gallbladder surgery by patients suffering from chronic pancreatitis without diabetic symptoms. In 1914, W. J. Mayo[26] stated that chronic pancreatitis is found extremely common in cholecystitis and advised the surgical treatment of the gallbladder for the cure of it. "It has been our experience," says Mayo, "that the removal of the gallbladder promptly relieves the symptoms, and permanently cures the patient of the symptoms of pancreatitis. Just what the future condition of the pancreas may be, one has no means of knowing, but I have found that chronic pancreatitis, the result of gallstone disease, is usually cured by removal of the stones and by drainage of the biliary tract, and that in chronic infection of the gallbladder with secondary involvement of the pancreas, in the absence of interference of the biliary drainage, cholecystectomy furnishes a satisfactory symptomatic cure." Exactly the same view regarding the surgical treatment of chronic pancreatitis is expressed by Deaver, Judd and Sweet.

Deaver assures us that the most frequent forerunner of disease of the pancreas is some infection of the gallbladder or the bile passages, which is frequently but not always associated with calculi. Sweet[28] proposes "to continue to think of chronic pancreatitis as a lymphangitis, secondary to a focus infection in the wall of the gallbladder, and he shall continue to remove the focus of infection and cure the condition."

Judd[29] maintains that pancreatitis occurs frequently with cholecystitis, and is a result of definite gross changes which occur in the pancreas. "While it is possible," says he, "that the inflammation of the pancreas may be due to the influx of bile into the pancreatic duct, Mann's recent experiments show that this does not occur except under unusual conditions. It is possible for infection to invade the pancreas by way of the lymphatics from the gallbladder, and in many cases this probably explains the source of infection. It is apparently entirely relieved by surgical treatment of the cholecystitis."

I consider the observations of the just named clinicians of importance because, if gallbladder surgery is so beneficial in pancreatitis, it follows that it should also be beneficial in diabetes, since this is the result of a pancreatitis.

The idea that in diabetes we are dealing with a pancreatitis is becoming widely accepted in recent years. Such men as Allen,[30] Cecil,[31] Ashoff,[32] Kauffman[33] and others have examined sufficient pathologic material to warrant their acceptance of such a view. Additional evidence in favor of the belief that in diabetes the damage to islands of Langerhans is only a part of a general pancreatitis can be gathered from the interesting investigation of Jones.[34] He found that out of a group of seventy diabetics, approximately fifty per cent showed both lipolytic and protelytic activities that were below the minimum normal level.

Another interesting laboratory study of recent date was carried out by Piersol and Bockus,[35] which lends support to the prevalent idea that cholecystitis frequently damages the pancreas. Forty cases of cholecystitis were studied in relation to the pancreatic enzymes and it was found that the average amount of each enzyme in cholecystitis was reduced to more than fifty per cent of the normal amounts.

My own observations on a small group of patients, as regards the incidence of diabetes, frank or latent, in patients suffering from cholecystitis, led me to the conclusion that it is rather high, namely, between seventy and eighty per cent. I have also seen beneficial results of gallbladder surgery on the diabetic symptoms in a few cases, but not until a larger number of cases is studied by me do I intend to publish the results of my observations.

It would seem from the evidence quoted above, that diabetes associated with cholecystitis can be cured or greatly benefited by gallbladder surgery. Such results can be explained only by the assumption that in that type of diabetes we are dealing with a pancreatitis which, no matter how originated, is apparently perpetuated by an infected gallbladder which acts as a focus of infection, and once this focus is removed, the beneficial results inevitably follow.

With our modern knowledge of the lymphatic system of the liver, gallbladder and pancreas, it would seem natural to expect that the nearest organs, to which the infection from the gallbladder is carried, must be the liver and the pancreas. According to Heyd,[36] it has been experimentally demonstrated by Franke that the pancreas can be infected through the lymph channels of the gallbladder. The beautiful work of Sudler[37] makes it easier to understand how an infection of any one of the three organs, liver, gallbladder or pancreas, means a coexisting infection of the other two, since the lymphatic vessels of the three organs form one communicating system.

It has been, on the other hand, known for some time that severe diabetes is apt to follow acute infections. That infections seriously aggravate an already existing diabetes is also a well established fact. It would seem that the pancreas suffers from the deleterious effects of general infections. That the pancreas is much more frequently damaged by infection than it has been generally supposed is becoming more widely recognized, especially since Whipple[38] demonstrated by his necropsies the great frequency of inflammatory pancreatic lesions in such cases, that did not show during life any evidence of pancreatic disease. But single infections apparently do not damage the normal pancreas to such an extent as to produce symptoms of permanent pancreatic insufficiency, not only because of the regenerative capacity of the gland, but also because of the great reserve it possesses. However, if an infected gallbladder is present, which for a number of years acts as a focus of infection, sending out bacteria and toxins to the pancreas through the communicating lymphatic system, permanent damage to the pancreas may result, producing in time diabetic symptoms.

PROBLEM STATED

Although sufficient clinical and laboratory evidence has been accumulated to warrant the conclusion that cholecystitis is an important etiologic factor in the causation of diabetes, there was a lack of confirmative evidence from the experimental side of the subject. In the words of Allen,[39] "no actual production of diabetes or the characteristic pancreatic lesions were found in a long list of acute and chronic infections, including distemper, rabies, pneumonia and various forms of sepsis, even when the pancreas remnant was bathed in pus of a peritoneal abscess."

This statement of Allen notwithstanding, I decided to conduct two series of experiments. One on dogs *with* the gallbladder and the other on dogs with the gallbladder *removed*. My object was to produce an experimental cholecystitis in one group of dogs, with the gallbladder retained, and by repeated infections to perpetuate the inflamed condition of the gallbladder, hoping to produce thereby a chronic pancreatitis. I expected to find evidence of damage to the islands of Langerhans with consequent diabetic symptoms, if the pancreatitis is kept up for a sufficiently long period. The cholecystectomized (second) group of dogs, was to be subjected to the same process of reinfection as the first group, with the object to ascertain whether the absence of the gallbladder would make any difference in the causation of diabetic symptoms.

METHOD OF EXPERIMENTATION

Experimental cholecystitis has been produced by a number of investigators,[40, 41, 42, 43, 44, 45] but of the different methods used for that purpose, I found the subcutaneous injection of active bacteria the most suitable method for my purpose. Accordingly, four healthy dogs were chosen and injected subcutaneously with the following bacteria: bacillus typhosus (dog No. 1), streptococcus hemoliticus (dog No. 2), streptococcus viridans (dog No. 3) and staphylococcus aureus (dog No. 4). The first injection was done on November 15, 1924, after the dogs were subjected to a glucose tolerance test, using LeGoff's[46] technic, and found to have a normal blood sugar and no glycosuria. The streptococcus hemoliticus and the staphylococcus aureus were cultured from infected tonsils, while the bacillus typhosus and the streptococcus viridans were active laboratory cultures.

To begin with, the twenty-four hour cultures were used, taking all we could get from the culture-surface, and diluting it in 10 c.c. of normal saline Commencing with two c.c. amounts of the suspension, injections were made every other day, increasing the amounts by one c.c. with each successive injection. After the full 10 c.c. of the suspension was given, and no evidence of infection could be observed, a forty-eight hour suspension was employed, again starting with two c.c. and increasing by one c.c. at each injection. Then seventy-two hours and ninety-six hours cultures were used, and so on until infection resulted.

After having injected the four dogs over a period of two months, dog No. 2 (streptococcus hemoliticus) and dog No. 4 (staphylococcus aureus) showed a temperature rise occurring at about the same time and lasting for ten days, the temperature reaching as high as 104° F. (rectal). Dog No. 1 (typhoid) and dog No. 3 (streptococcus viridans) showed an elevation of temperature from time to time, but never lasting over two days. Blood counts showed a leucocytosis with each temperature rise. After ten days of normal temperature, every one of the four dogs were operated on, the bile withdrawn with small gauge needles, carefully avoiding trauma of the gallbladder; cultures were prepared and were found to contain the very same bacteria that were injected. The animals were allowed to rest three months, and then again operated on, when the bile was found to be infected with the same organisms in all but the dog No. 3 (streptococcus viridans); grossly the gallbladders appeared to be thickened and shrunken in dogs No. 2 and No. 4.

We then started the injection for the second time. We could not produce any infection in dog No. 1 (bacillus typhosus), in spite of injecting the animal for three months, using the same technic as described above. We then discontinued the injections, and two weeks after stopping them the temperature gradually rose to 105.5°, septic in type, continued for fifteen days and then returned to normal; the dog was very ill, refused food, but drank freely of water; there was no leucocytosis, however. The dog was subjected to a glucose tolerance test after ten days of normal temperature, and the blood sugar was found to be of a diabetic type, but there was no glycosuria.

Injections of the same bacterium were started for the third time, and were continued for a month and a half, until the temperature rose to 103° in the afternoon, with slight reduction in the morning, and continued for six days. After ten days of normal temperature, a glucose test meal was given to the dog and a *high blood sugar curve of the diabetic type was found; there was also a glycosuria a half hour* after the glucose meal.

Dog No. 2 (streptococcus hemoliticus) received his second series of injections for two and one-half months before the fever developed; the temperature rose as high as 103.5° and continued for fourteen days with slight morning remission. The animal then rested for one and a half months before the injections were resumed. In two months the temperature rose to 104°, with morning remissions to 101° and continued for six days. After ten days of normal temperature the blood sugar, after giving the dogs the glucose tolerance test, was already higher than normal, though there was no glycosuria.

Injections into the same dogs were started for the third time. After two months the temperature rose, lasting eight days, 101° in A. M. and 104° in P. M.; leucocytosis was present. *After ten days of normal temperature the blood sugar showed a high curve of the diabetic type. There was a glycosuria one-half hour after glucose was taken.*

Dogs No. 1 and No. 2 were sacrificed and the sections of the liver, gallbladder and pancreas were made. The pathologic report on the sections of the gallbladders, livers and pancreases of the necropsied dogs, made by Prof. Frank Menne, points out the evidence of inflammation in those organs, as well as the toxic damage done to the islands of Langerhans.

In order to see how the pancreas would respond to infection, if the gallbladder is removed, we selected as a control two dogs, removed their gallbladders and injected one with bacillus typhosus (dog No. 5) and the other with streptococcus hemoliticus (dog No. 6). The dogs went through practically the same series of infections as the first two dogs (No. 1) and (No. 2), but no evidence of damage to the islands of Langerhans could be observed, as judged by the glucose tolerance tests.

Our bacteriologic findings were checked up in the laboratory of the Department of Bacteriology and the University of Oregon Medical School. The blood sugars were checked in the Laboratory of the Portland Free Dispensary.

Dog No. 3 (staphylococcus aureus) was injected for the second time, and after nine weeks the temperature rose, but an abscess developed. We allowed the animal to rest for one month and renewed the injections for the third time; after seven weeks he developed another abscess and died.

Dog No. 4 (streptococcus viridans) was injected for the second time, but in spite of the three months of continued injections, neither rise of temperature or leucocytosis was noted. After a month's rest the blood sugar was normal after a glucose tolerance test was given. A third series of injections was started and no rise of temperature occurred after two months of continued injections. There was no hyperglycemia after ten days of normal temperature.

We conducted another series of experiments on four dogs, using the same technic as described above, but injecting different microorganisms, namely: *staphylococcus albus, micrococcus catharralis, B. coli, and pneumococcus type I.* In this series of experiments it seemed impossible to obtain a febrile reaction, in spite of long continued injections extending over a period of six months.

SUMMARY

In our injection experiments with dogs we succeeded in demonstrating that lesions of the islands of Langerhans, resulting in diabetic symptoms, can be produced by hematogenous infections with streptococcus hemoliticus and bacillus typhosus, if carried on for a sufficiently long period. The fact that we never succeeded in lowering the sugar tolerance in animals with their gallbladders removed would seem to point to the importance of the infected gallbladder in damaging the pancreas, and particularly the islands of Langerhans, to such an extent as to produce diabetic symptoms.

It is interesting to note that, whenever in our experiments the injections produced febrile reaction, the microorganisms injected were found in the gallbladder. I am inclined to think that the same takes place in the human organism. Such a supposition would explain, in part at least, the well known fact that infections seriously aggravate the symptoms of diabetes.

Our next series of experiments will be conducted with a somewhat different technic, in order to hasten the process of infection. We expect to produce a permanent damage to the islands of Langerhans, and to observe what effect the removal of the gallbladder will have on such damage.

In conclusion, I wish to express my thanks to Mr. French Moore, Prof. Frank Menne and Drs. M. E. Steinberg and Thomas Wyatt for their valuable assistance and suggestions.

(Owing to limitation of space, the bibliography has been omitted, which will be published with reprints.)

SURGERY IN THE PRESENCE OF DIABETES MELLITUS*

Lester J. Palmer, M.D.
SEATTLE, WASH.

Five years ago this subject was so surrounded by gloom and pessimism that few surgeons or internists cared to discuss it. Formerly many patients with diabetes mellitus, having surgical lesions, were allowed to die without any attempt at operative interference. This is no longer the case. Today the situation has changed entirely. Although surgery performed upon diabetic patients is not attended by the lowest mortality, the death rate compares favorably with that among surgical cases generally.

What has brought about this improvement? Certainly it would have been impossible without insulin. However, insulin alone has not given the surgeon this greater sense of security in regard to operations upon diabetic patients. Modern advances made in nutritional studies, a better understanding of these principles and of the chemistry of the disease by more thoroughly trained internists, better cooperation between surgeons and internists, better surgical technic in this special branch of surgery, less harmful anesthetics, earlier operation, better hospital facilities, including laboratory and dietetic service—all of these have combined to lower the mortality of operations upon patients having diabetes mellitus.

Thus, Allen recently has said, "America has reversed the old European rule that surgery on patients with diabetes mellitus should be avoided as far as possible." Wilder and Adams[1] state that a previous surgical mortality of 7 per cent at the Mayo Clinic has been reduced to 1.2 per cent during the past two years. This percentage is based on 327 operations performed upon 251 patients. Foster[2] reports a drop of surgical mortality from 40 per cent during the decade preceding the advent of insulin to 12 per cent during the first year of its use.

Wonderful as this improvement has been, there is a limit to the reduction of surgical mortality among diabetic patients. The risk in this class of patients will always be somewhat higher than the general average. Joslin[3] has given us the reason why this must be so. He has shown by various series of collected cases that 51 per cent of the cases of diabetes occur during the sixth and seventh decades of life. It is even more true that we are called upon to subject diabetic patients to surgery many times more often during these two decades than at any other age. The wear and tear of life have at this age left their mark in varying degrees upon the vital organs, particularly upon the cardiovascular and renal systems. Diabetes, the disease, has caused these changes to be more profound than they would otherwise have been.

Jones[4] reminds us that "we must, therefore, compare the results of surgery in these cases with a group, 51 per cent of whom average sixty years old and in whom there is a high percentage of damaged circulatory systems and kidneys." The healing of wounds is delayed or prevented, or complicated, by gangrene in the presence of marked hyperglycemia, dehydration and acidosis. Modern equipment for the treatment of diabetes successfully mitigates these one time serious factors in the high surgical mortality among diabetics. However, our modern equipment will not remove the obstacles to healing so frequently presented by deficient circulation due to arterial damage. It is fortunate that this last mentioned obstacle is practically never a factor except in the extremities, and particularly the lower extremities.

Bauman[5] has given a classification of the surgical conditions occurring in the presence of diabetes which is complete and satisfactory: First, those more or less characteristic of the disease, that is, carbuncle and gangrene; and, second, those that are purely accidental or coincidental. The second group may be subdivided into conditions that require immediate operation and those for which operation may be deferred.

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* From the Mason Clinic. Read before the Vancouver, B. C., Medical Society, Feb. 2, 1926.

Carbuncle may be considered alone. The surgical treatment may not be deferred. Excision is probably a better procedure than crucial incision. Control of the diabetes must be established as soon as possible to insure healing.

Gangrene may be superficial or deep, limited or extensive. Two types occur: First, that type in which infection is largely absent and circulatory disturbance predominates; second, that type in which infection is very active and extensive. In the first type, particularly if superficial or limited in extent, exact control of the diabetes may result in healing or demarcation and separation of the affected part. If extensive or extending, prompt amputation is indicated. The site for amputation is governed by the site of election, rate of progression of the advancing margin, and the condition of the circulation. Radiograms of the part, extending well above the lesion, and the quality of pulsation in the arteries both give valuable information. In the second type of gangrene, when infection is active and extensive, immediate amputation is imperative to save life. In that case, the control of the diabetes must be established by the internist, coincident with the surgical interference by measures to be outlined later.

In the second group of surgical conditions occurring in the presence of diabetes, that is, those which are accidental or coincidental, there are two classes of cases, as mentioned above: those in which surgical intervention cannot be deferred without danger and those in which intervention may be deferred with safety. In the first class the indications for operation, at least as to time, are the same in the presence of diabetes as in its absence. Control of the diabetes and safeguarding of the patient against complications which may be precipitated by surgery must be handled by the internist, just as in the cases where immediate amputation is imperative.

In the second class of these cases, namely, those in which operation can be deferred, control of the diabetes should be established before operation. The time required for establishment of this control should not exceed a few days. Examples of conditions which may be classed in this group are: Cholecystectomy for chronic gallbladder disease or gallstones, thyroidectomy, herniotomy, nephrectomy, or prostatectomy.

At this point we may discuss the indications for or permissibility of this type of surgery in the presence of diabetes. In general it may be stated that, with the modern equipment for controlling the diabetes, all other things being equal, no greater mortality should accompany this type of major surgery on diabetic than on nondiabetic patients. However, some major surgery of this type may be meddlesome when performed upon diabetic patients, whereas it would not be considered so upon nondiabetic patients.

In the opinion of the writer, examples of such surgery would be thyroidectomy for colloid goiter or nontoxic adenomata of the thyroid when done for cosmetic reasons, nephrectomy for silent calculus, or nephropexies, prostatectomy in patients without retention, gastroenterostomy for peptic ulcer without obstruction or perforation. I desire not to be misunderstood. The meaning intended is that surgery of this major type, falling in the group where surgery may be deferred, must be absolutely indicated as the only or best method of treating the condition and must give promise of a high degree of relief from the condition for which it is performed, or of a definite improvement in or arrest of loss of tolerance.

One or two conditions may be made the subject of special comment. There is some difference of opinion as to just what should be done about chronic gallbladder infection. Some believe there is no greater incidence of gallbladder disease among diabetic patients than among patients in general. Others believe there is a much higher incidence of this condition among diabetics. Some believe that any degree of chronic cholecystitis, active or quiescent, will cause progressive loss of tolerance in the diabetic. In this connection Wilder recently reports 82 deaths among 2500 patients having diabetes. Fifty-one autopsies were done. Thirty-three per cent of the autopsied cases showed gallstones.

Our attitude upon this particular phase of the subject has been as follows: First, that there is a frequent incidence of cholecystitis among diabetics, possibly greater than among our patients in general; second, that any source of infection, acute or chronic, present in the diabetic patient tends to cause progressive loss of tolerance or at least to prevent a gain, both varying in degree in different patients. For this reason all sources of infection are corrected if possible. But the risk involved in removing a gallbladder as a source of chronic infection is much greater than that involved in removing abscessed

CASE 1

Mrs. W. W.—Age 45—Diag.: Diabetes Mellitus; Toxic Adenoma Thyroid. No. 18193

						DIET					BLOOD CHEMISTRY			
Date	In	Out	Alb.	Ket.	Sug.	Ch.	Prot.	Fat	Sug.	CO₂	Bmr.	Ins.	B. P.	Wgt.
4-14-25	2500	1900	TR	4	81	40	50	100	.40	54			135 95	145
4-25-25	2500	1800	0	0	0	40	50	100	.20			60		149
5- 6-25	2500	1800	0	0	0	50	50	125	.20			60		147
5-25-25	?	1800		0	0	50	50	125	.23			60		146
6-22-25	?	1800		0	0	60	60	125	.18			40		146
2- 9-25	?	1800		0	0	70	60	125	.28		x25	30		142
9- 3-25	?	1800		0	0	70	60	125	.25		x53	40		134
9- 5-25	2500	2000	TR	0	0	70	60	100	.28		x31	50		130
9-17-25	2500	2000	0	0	0	70	60	100	.16			80		
						THYROIDECTOMY								
9-30-25	2500	2000	0	0	0	70	70	175	.13			50		130
10-16-25	?	2000		0	0	70	70	160	.16			40		141
11- 6-25	?	2000		0	0	70	70	160				40		141
11-19-25	?	2000		0	0	70	70	160	.21		x 2	35		141
1-12-25	?	2000		0	0	70	70	160	.25			40	130 85	141

CASE 2

Mr. P. S.—Age 46—Diag.: Diabetes Mellitus; Chronic Cholecystitis. Complications: Infected Hand. No. 14189

						DIET						BLOOD CHEMISTRY				
Date	In	Out	Alb.	Ket.	Sug.	Ch.	Prot.	Fat	Sug.	CO₂	Urea	Creat	Ins.	B. P.	Temp.	Wgt.
10-22-23	2500	2100	TR	1	87	30	45	100	.42	54	18	2.2	20	100 85	101	128
11- 7-23	2500	1800	0	0	0	80	80	180	.25	68			35		99	136
12- 3-23	?	1500	0	0	0	100	80	180	.25				35			143
1- 2-24	?	1500	0	0	TR	80	80	180	.30				45			135
1-17-24	2500	1900	0	0	TR	60	60	150	.28				40			
1-20-24	2500	2000	0	0	0	60	60	100	.18				40			
						CHOLECYSTECTOMY										
2- 6-24	2500	2000	0	0	0	60	60	150	.20				35			
3- 6-24	?	1800		0	0	70	70	170					40			128
5-13-24	?	1800		0	0	90	80	180	.25				40			135
10-30-24	?	1800		0	0	80	80	200	.24				40			150
2-12-25	?	1800		0	0	80	80	200	.25				40			155
11- 4-25	?	1800		0	0	80	80	200	.25				40			164

teeth as a source of infection. We have also believed that a quiescent gallbladder infection is probably entirely latent as far as the pancreas is concerned and for this reason we have done cholecystectomy only on those cases, where activity of the infection was positively present, or repeated colics were occurring.

The second condition deserving special comment is thyroid disease. Fitz was able to collect only eighteen cases of proven exophthalmic goiter and diabetes. Toxic adenoma is much more common. Several internists who give special attention to diabetes believe that correction of a hyperthyroidism always sharply improves sugar tolerance in the diabetic. We have done but one thyroidectomy for hyperthyroidism, but in this patient there was marked improvement in the psychic and nervous condition and four months after operation a moderate improvement in tolerance. One case of typical exophthalmic goiter and proven diabetes received iodine for the hyperthyroidism. The insulin required was necessarily lowered early in the management to an amount very small, compared to what would usually be required by a case of that apparent severity. The question arises as to whether or not there is any interrelation between the thyroid and the pancreas, both internal secretory organs, or if the improvement in tolerance noted by various observers is not the same as might be found after any procedure which improves the general health of the diabetic patient.

Just what measures constitute the best medical support of the patient during emergency surgical operations, or the best control and preparation of the patient for deferable surgical procedures, should be briefly outlined. As to emergency operations, measures employed vary, naturally, according to the blood and urine findings, the clinical condition of the patient, and the duration of the surgical condition. When infection of any kind is present in such degree as to cause a constitutional reaction, the essential effect is an increase in the severity of the diabetes; this results in lowered tissue resistance, permitting progression of the infection, which again further augments the diabetes. Thus a vicious circle is established. Dehydration, if present, must be corrected by the introduction of fluids by any or all possible methods.

If acidosis is present, as evidenced by the presence of ketone bodies in the urine and lowered alkali reserve, sufficient insulin must be given before, during and after operation to reduce or at least prevent an increase in the degree of this condition. Some authorities believe that, regardless of the amount of glucose available in the blood, the quantity of insulin necessary to combat the acidosis should be buffered by administration of glucose, usually one gram for each unit. These authorities advise the routine intravenous administration of 500 c.c. of a 5 per cent solution of glucose, containing twenty-five units of insulin. Joslin is authority for the statement that he has not been able to bring himself to giving sugar as such to a diabetic, particularly in the face of marked hyperglycemia and glycosuria. If a high blood sugar content exists, and it can be determined, using an inlying catheter, that sugar remains present in the urine, or if the blood sugar remains high, it probably is unnecessary to buffer the insulin given. If the blood sugar content is relatively low and little or no sugar is present in the urine, glucose must be given to buffer the insulin required to promote oxidation of the ketone bodies present and being produced. Except in rare instances, however, this glucose may be given as orange juice or oatmeal gruel by mouth.

The policy just outlined has been followed by us and it has not as yet been necessary for us to buffer even quite large amounts of insulin with glucose given intravenously. It may occasionally be necessary to give glucose solution per rectum, when the nature of the surgical procedure prohibits or vomiting prevents the taking of liquids by mouth for any considerable period of time. In rather rare instances even intravenous administration of glucose must be resorted to, when surgical procedure or diarrhea, in addition to the foregoing, prevents using the rectum as a port of entry. Unless these contraindications exist, orange juice and oatmeal gruel, given freely by mouth, usually supply sufficient glucose for buffer purposes. Foster suggests the use of milk during this primary crucial period. After most laparotomies, unless vomiting is present, these three liquids are not contraindicated in frequently repeated teaspoonful quantities.

When a day or two delay is permissible for preparing the diabetic for operation, glycemia should be reduced to at least 200 mg. per 100 c.c. and the alkali reserve raised to at least 50 volumes per cent. Too great a restriction of carbohydrate intake should not be made, particularly in the presence of infection or in elderly diabetics, because of the danger of depleting the glycogen stores, but rather more insulin should be given to remove ketone bodies, lower the glucose content of the blood, and increase glycogen reserve. Protein intake also should not be less than the usual, but fat intake should be reduced to a very small amount.

During immediate postoperative days these patients are handled in a manner similar to that employed following emergency surgical intervention, although as a rule they are much less of a responsibility. As soon as vomiting or diarrhea ceases, if either is present, and as soon as the surgical condition will permit, these patients are placed successively upon soft, semisolid and finally solid food. Protein intake is at all times kept at about the usual amount. In general, carbohydrate intake is maintained high and cared for with the necessary amount of insulin, and normal amounts of fat are added to the diet last.

A few remarks need be made about the choice ot anesthetic. Chloroform should never be used. Ether should be avoided, if possible. Nitrous oxide and oxygen alone, or combined with local anesthesia, used either by infiltration or preferably as nerve blocking, is very satisfactory. Spinal anesthesia is probably the safest anesthetic from the standpoint of the diabetes. Ethylene also is entirely satisfactory.

To summarize: Emergency surgery can be safely done in the presence of diabetes.

Surgery for the relief of chronic conditions, the effect of which is unfavorable upon the diabetes, may be safely done and is indicated.

There is no justification for surgery which is not so indicated.

Finally, the following factors are essential in maintaining a low mortality: Early diagnosis, early decision to operate, proper metabolic preparation of the patient if time permits; if not, proper metabolic support during the emergency, relief of dehydration and circulatory support, proper selection of the anesthetic, a competent surgeon experienced in diabetic surgery, short operation, competent nursing, competent metabolic aftercare.

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THE CONTROL OF SCARLET FEVER

George F. Dick, M.D.
and
Gladys Henry Dick, M.D.
CHICAGO, ILL.

(Concluded)

PREVENTIVE IMMUNIZATION

Last night I spoke of the attempts at inoculation against scarlet fever made during the latter part of the eighteenth and the first half of the nineteenth centuries. Since the science of bacteriology was still undeveloped, it was not possible to vaccinate with any but crude materials, such as blood, skin scales and exudates.

With the failure to find any desirable method of preventive immunization with such materials, attempts to control scarlet fever by vaccination were abandoned until the first part of this century, when the work of Wright and others created great interest in the use of killed bacterial vaccines in the prevention and treatment of disease. Attempts were made to control a number of infections in this way, and a striking success was attained in typhoid fever.

The etiology of scarlet fever had not been determined, but the association of streptococci with the disease was recognized, and they were known to play an important part in the frequent and serious complications and sequelæ. Without waiting for proof of their etiologic significance, vaccines of killed streptococci were prepared and used in attempts at prevention, and in the treatment of scarlet fever and its complications. Such vaccines were often employed by physicians who did not credit the hemolytic streptococcus with causing scarlet fever, but considered it the most harmful and constant secondary invader.

Of the streptoccocus vaccines the one most extensively used was Gabritschewsky's,[22] which was described in 1905. In his first article he spoke of the successful use of streptococcus vaccines in diseases of horses, then said: "Therefore, it is logical to assume that vaccines may prove to be effective also in prevention of grave streptococcus affections, such as erysipelas, postpartum septicemia, acute polyarthritis, angina, endocarditis, and other septic infections.

"It may not yet be proved that streptococcus is the primary and main factor in scarlet fever, but its constant presence in the throat, as well as in the blood of patients with scarlet fever before and after death, also in the suppurated lymph glands and the organs, shows that the streptococcus causes a regular and dangerous complication of the disease."

Gabritschewsky's preparation was a true bacterial vaccine, made by cultivating streptococci, freshly obtained from the heart's blood of fatal cases of scarlet fever, in broth; killing the culture by heat; sedimenting the bacteria; and discarding the supernatent fluid, retaining only enough to make the desired bacterial suspension. The vaccine was standardized according to its content of dead bacterial bodies, so that each cubic centimeter, on centrifuging, yielded two to three-hundredths of a cubic centimeter of bacterial mass.

The irregular results obtained with this vaccine led to the assumption that some lots contained an active principle which was absent from other lots. Since Gabritschewsky insisted on the importance of preparing the vaccine from freshly obtained cultures, it was thought by many that the active principle was a filterable virus, associated with the streptococcus in some cultures and not in others. Zlatogoroff,[23] a pupil of Gabritschewsky, who used the vaccine extensively, still adheres to this view.

After the discovery of the specific toxin of scarlet fever, and the development of a skin test for determining susceptibility to the disease, we attempted active immunization by hypodermic injections of graduated doses of the sterile toxin. In this preventive immunization it is necessary to administer enough toxin to produce immunity without causing harmful reactions. Since the toxin of scarlet fever is less injurious in its action than diphtheria toxin, it is not necessary to add antitoxin or to decrease the toxicity by chemical modification in order to employ it in amounts large enough to immunize.

The addition of antitoxin to the toxin for preventive immunization is undesirable, because it would introduce an unnecessary complication, as well as the danger of sensitizing to foreign serum.

Zoeller[24] has reported the use of scarlet fever toxin modified by the addition of formaldehyde. Such chemical modification, resulting in a decreased toxicity or toxoid, would be desirable, if it could be accomplished without necessitating the injection of too large volumes of the modified toxin.

The preventive immunization with scarlet fever toxin must be carried to the point of an entirely negative skin test, if it is to furnish effective protection against the disease. With properly graduated doses, given at intervals of five to seven days, it is possible to immunize all susceptible persons to the point of a negative skin reaction without undesirable results.

The amount of toxin required to immunize different persons varies greatly. Up to a certain point the percentage of persons completely immunized bears a direct relation to the amount of toxin administered. We have been gradually increasing the immunizing dosage as we learned that it is safe and necessary. Some health departments, particularly the New York City health department, have employed scarlet fever toxin in preventive immunization on a large scale, but have administered it in doses too small to produce a satisfactory immunity in the majority of susceptible persons. They have given a first injection of 250 skin test doses; a second of 500; then 1,000 and 2,000; making a total dosage of 3,750 skin test doses, an amount which, in our experience, produced a negative skin in less than fifty per cent of susceptible individuals. Toxin put up in this inadequate dosage has been widely distributed by some commercial firms.

At present we are using a total of forty-seven thousand skin test doses of toxin, and administering still more, if necessary. The largest amount of toxin we have yet given any one person is one hundred and sixty thousand skin test doses. The largest single dose we have yet employed is thirty-five thousand skin test doses of a phenolized preparation.

The size of the first immunizing dose is important. It should be small enough to avoid severe reactions, yet large enough to stimulate the production of antitoxin, so that a larger amount of toxin may be safely given for the second dose.

No dose should be out of proportion to the one that preceded it. A first dose of 500, a second of 2,000 and considerably larger third doses have been given in a large series without any undesirable reactions.

We have not observed bad effects from preventive immunization. No necrosis, sloughs or secondary infections have occurred; nor have we observed any injurious effect on the heart, kidneys or other organs. However, it is reasonable to suppose that too large doses might prove harmful.

The reactions that occur are either local or general. There is nearly always some local reaction at the site of injection. It consists of swelling and reddening, which appear within a few hours, and begin to subside in forty-eight hours. The intensity of this local reaction varies with the susceptibility of the person. There may be some desquamation over the area of skin involved.

General reactions, when they occur, usually follow the first dose. They may consist of one or more symptoms, including general malaise, nausea of a few hours duration, and light, transient scarlatinal rashes. These reactions begin in a few hours after the injection and subside in forty-eight hours. They occur only in highly susceptible persons who, if they have a general reaction after the first dose, do not as a rule have general reactions after subsequent doses. Lowering the initial dose does not completely eliminate the possibility of these symptoms. None of the reactions are so severe as those that may occur during the course of immunization to typhoid or diphtheria. But if improperly graduated doses of toxin are employed, severe reactions may follow any dose that is disproportionately large. This may also happen, if the toxin used in the first doses is deteriorated.

The active immunity produced by injections of graduated doses of sterile scarlet fever toxin requires more time to develop than the passive immunity conferred by prophylactic doses of the antitoxin, but it is more permanent. In order to determine how long it takes the active immunity to develop, retests were made at intervals of three days to one year after the administration of the toxin. The results of these tests indicated that the active immunity is developed within one to two weeks. That incomplete immunization does not usually progres to complete immunity without further administration of toxin was shown by the results in a series of experiments, in which persons were only partially immunized, and then retested at intervals of one month, two months, six months and one year. In none did the partial immunity progress to complete immunity. The effectiveness of active immunization in the prevention of scarlet fever meets its most rigid test in the contagious disease hospitals, where this method of controlling the disease is used to protect the interne and nursing staffs. In the past three years, we have had an opportunity to observe the results of active immunziation with the toxin in the nurses of two contagious disease hospitals. These nurses are undergraduates who are assigned to the contagious disease hospitals for three months training, and they are constantly exposed to scarlet fever during this period. Up to the time that preventive immunization was started, scarlet fever was prevalent among them. By means of the skin test and preventive immunization of the susceptible, it has been possible to prevent the occurrence of scarlet fever among these internes and nurses.

Altogether, three hundred and sixty nurses and internes were found susceptible and immunized with the toxin before they undertook the care of scarlet fever patients. In spite of the prolonged exposure to the disease, no case of scarlet fever developed in this series, while in a control series of two hundred and forty-two nurses and internes, who were not tested or immunized before exposure, scarlet fever developed in ten per cent.

In another series of six hundred and eight susceptible persons, immunized to the point of an entirely negative skin test with the toxin, there have been no cases of scarlet fever. The exposure in this series was direct but less protracted than that of the nurses, and many would doubtless have escaped infection without any preventive measure.

In order to learn something about the duration of immunity, groups of persons with positive skin reactions were immunized, and retested at intervals of two weeks, three months, six months, one year, one and a half and two years. In each case the retests were negative. In interpreting these results, the possibility of exposure and an unrecognized infection occurring in the intervals between the tests must be kept in mind.

It has thus been demonstrated that scarlet fever toxin may be administered with safety in doses large enough to confer complete immunity, that active immunity is developed within two weeks after the last dose of toxin, and is sufficiently permanent to be of practical value in controlling the disease.

After the recognition of the specific soluble toxin of scarlet fever and its corresponding antitoxin, it became apparent that, if the scarlet fever patient could be supplied with antitoxin early in the disease, his chances of recovery would be greatly increased. In order to obtain a supply of antitoxin for this purpose, horses were immunized to the toxin by subcutaneous injections of gradually increasing doses.

Antistreptococcic serums had been in use for more than twenty-five years. In 1895, Marmorek prepared a serum by immunizing horses with injections of living streptococci. This serum was not produced with a view to its use in scarlet fever alone, but with the idea that it would be useful in all streptococcus infections. Since then many antistreptococcic serums have been prepared for use in scarlet fever. In some instances, notably that of Moser's serum, these antistreptococcic serums were prepared on the supposition that streptococci were the causative agents in scarlet fever. Other serums, such as those of Aronson and Savchenko, were prepared to combat the harmful effect of the hemolytic streptococcus as a secondary invader. The various serums were obtained by methods which differed in detail of technic, but all had for their object the production of an antibacterial serum which would act directly on the streptococci. At times the first injections of living bacteria resulted in infections that killed the horses. In order to avoid this loss, some workers preceded the injections of living cultures by preliminary injections of filtrates or attenuated cultures. This was done by Courmont, of Lyons, in 1898.[25]

All attempts to standardize these antistreptococcus serums were based on their content of bacterial antibodies, estimated chiefly by means of agglutination tests. Of these serums, the one reported by Moser[26] in 1902 was most widely used. It was obtained by immunizing horses with living serum-broth cultures of streptococci, isolated from the heart's blood of fatal cases of scarlet fever. Moser reported a series of cases treated with his serum, and two control series, one treated with normal horse serum, the other with Marmorek's serum. He noted that, following the administration of his serum, there was an improvement in the symptoms of scarlet fever commonly attributed to the toxemia, as well as a fading of the rash.

At intervals during the last twenty-three years various antiscarlatinal serums have been described and placed on the market, the latest of which was described by Dochez and Sherman[27] in 1924. None of them has differed essentialy from the serum described by Moser in 1902. At first such serums were employed extensively, but gradually fell into disuse. Their failure was due to lack of specificity and lack of potency, as well as to the frequent and severe serum reactions caused by relatively large doses of unrefined horse serum. Since the existence of an antitoxin for scarlet fever had not been recognized, and dependence was placed on the antibacterial nature of these serums, no attempt was made to concentrate the antistreptococcic serums or test them for antitoxin.

In the concentrated and standardized scarlet fever antitoxin these objectionable features of the unconcentrated antistreptococcus serums have been overcome. The concentrated antitoxin is standardized against the toxin, and its potency expressed in the number of skin test doses of toxin neutralized by one cubic centimeter. We have found that 1,000 skin test doses of sterile scarlet fever toxin injected subcutaneously into susceptible adults is capable of producing transient symptoms of scarlet fever, provided there has been no previous immunization. An amount of antitoxin capable of neutralizing twenty times this quantity of toxin has been found to have definite therapeutic value.

Since it is undesirable to inject large quantities of even a refined serum, a minimum potency requirement has been established. This requirement was such that one therapeutic dose should not exceed twenty cubic centimeters. As we were able to produce more potent antitoxins, this minimum requirement has been raised from time to time, and it is probable that still further changes will be made which will increase the potency of the serum, and reduce the volume of the dose.

The prophylactic dose should be one-half the therapeutic dose. In actual practice we find that the prophylactic dose is employed up to the time that a rash appears. This means that it is really used as a therapeutic dose in the early stage of scarlet fever, and it should be large enough to cut short the course of the disease in this early stage. For this reason we have insisted on a comparatively large prophylactic dose.

The results of the administration of antitoxin have been studied in a series of three hundred cases of scarlet fever, and compared with a control series. The antitoxin in all our cases has been injected into the muscles of the thigh. We have employed intramuscular injections because the time saved by intravenous injection does not usually justify the increased danger to the patient.

In early cases the rash is the most convenient indicator of the action of the antitoxin. If enough antitoxin has been given, there will be a definite fading of the rash within twenty-four hours, accompanied by an improvement in the general condition of the patient, especially noticeable in the early and in the toxic cases.

Following the removal of the toxic element of the disease, the course of the temperature will depend on the presence or absence of complications. One effect of the antitoxin is the unmasking of the complications that already exist, making their recognition and proper treatment more certain. In our series one of the most striking effects of the antitoxin has been the reduction in the incidence of complications. They occurred in thirty-eight per cent of the control series, and in eight per cent of the antitoxin series.

There is considerable variation in the severity of scarlet fever. This variation in severity may be attributed in part to the difference in degree of susceptibility of different individuals, in part to the difference in strength of the toxins produced by different strains of streptococci, and also to the localization of the streptococci in the body. We have observed that in patients with sinus infections, where the conditions are favorable to the production and absorption of large amounts of toxin, there is often a high degree of toxemia. In these cases it may be advisable to administer two therapeutic doses of antitoxin.

A comparison of the temperature curves of scarlet fever, complicated with sinus infections treated with antitoxin and the temperature curves of similar cases treated without antitoxin, showed that, following administration of antitoxin, the temperature dropped to a lower level, but did not immediately return to normal; while without the antitoxin, the temperature remained at a higher level, and returned to normal more slowly.

With the exception of one death due to a neglected otitis media, all the deaths in our series occurred in patients who had been sick six to twenty-eight days and had developed a hemolytic streptococcus septicemia, which was demonstrated by blood cultures before the antitoxin was given.

Three of the five fatal cases were in adults who had anuria on admission to the hospital and died within twenty-four hours. Two were in patients who had survived the toxic stage of the disease, but had developed mastoiditis with thrombosis of the lateral sinus, and metastatic abscesses before antitoxin was given. In two adults who were extremely toxic and had large amounts of albumin in the urine, administration of two therapeutic doses of antitoxin was followed by rapid recovery, and there was no evidence of nephritis during convalescence.

These results show that concentrated and standardized scarlet fever antitoxin is of practical therapeutic value. They emphasize the necessity for giving the antitoxin early in the disease before complications have occurred and before too much damage has been done to the tissues. If administered early in the disease and in adequate dosage, the antitoxin shortens the course of scarlet fever and reduces the number of complications and sequelæ.

The skin test for susceptibility to scarlet fever used in connection with preventive immunization with the toxin, and the prophylactic administration of antitoxin makes possible the control of scarlet fever epidemics. In an institution where adequate facilities for throat and nose cultures are available, it is possible to get the epidemic under control within forty-eight hours.

The method of procedure in epidemics consists of making skin tests and throat cultures as soon as possible. The throat and nose cultures are made on blood agar plates which are incubated over night. The next day the skin tests are observed and the persons tested are divided into two groups according to the results of the skin tests. The susceptible persons are separated from the immune.

Each group is then divided according to the results of the throat and nose cultures. The immune persons who show no hemolytic streptococci in their cultures receive no further treatment. The immune persons, who have hemolytic streptococci in their cultures, are isolated from all susceptible persons on the supposition that they may be immune carriers of scarlet fever streptococci.

The susceptible persons are divided into two groups, according to whether or not they have hemolytic streptococci in the throat and nose. Those who show these organisms are regarded as infected, isolated from the susceptible persons who are not infected, and given a prophylactic dose of scarlet fever antitoxin.

In the susceptible persons who have no hemolytic streptococci in the nose or throat, preventive immunization with the toxin is started. During the course of this immunization they are not allowed to associate with the immune carriers or the infected susceptibles who have been protected by antitoxin nor are they permited to come in contact with scarlet fever patients recently discharged from quarantine.

Since the passive immunity conferred by the antitoxin cannot be depended on to last more than three weeks, active immunization with the toxin may be started two to three weeks after the antitoxin has been given, provided the nose and throat cultures have meanwhile become negative for hemolytic streptococci. It may be that some persons are classed as carriers or as infected who have hemolytic streptococci in their throats that are not capable of producing scarlet fever, but the short incubation period of scarlet fever does not allow sufficient time to test these organisms for specific toxin production.

In circumstances which do not permit throat and nose cultures it is best to make skin tests, and watch the susceptible persons closely for early symptoms of scarlet fever, such as fever and sore throat, and administer the prophylactic dose of antitoxin only if necessary. Administration of prophylactic doses of antitoxin to all the other members of a family when one is attacked by scarlet fever is scarcely justified by the results of skin tests, combined with throat and nose cultures which show that under such circumstances the other members of the family may be immune or not infected.

We have had an opportunity to employ this method of controlling scarlet fever in two hundred and eighteen families in which scarlet fever had occurred and in epidemics in four different institutions. No more work is required than in making Schick tests and cultures on Loeffler's medium for the control of diphtheria, the chief difference being that in the case of scarlet fever blood agar plates are used instead of the tubes of Loeffler's medium. No microscopic examination of the scarlet fever cultures is necessary. No new cases of scarlet fever developed in these families or institutions later than forty-eight hours after the control of the epidemic was undertaken, except in instances where for some reason it was not possible to follow the prophylactic administration of antitoxin by active immunization with the toxin before another exposure to immune carriers or the return of the convalescent scarlet fever patient to the home.

INDICATION OF NEPHROSTOMY PRELIMINARY TO URETERORECTONEOSTOMY. In those desperate cases in which one reasons that the patient may die after ureteral transplantation but he most certainly will die if the ureter is not transplanted, Frank Hinman, San Francisco (*Journal A. M. A.*, March 27, 1926), says that it would seem more logical from a surgical standpoint to perform nephrostomy as a preparatory measure to subsequent ureteral transplantation, should conditions then justify it. The lumbar drainage leaves an avenue of direct treatment and free outlet for the urine from the kidney. As a matter of fact, one could now do as he wished with the lower end of the ureter. Such nephrostomy drainage would do away with the danger of early ascending infection and obstruction from the early edema during the time of healing, thus obviating the need of tubes and their dangers. Through such a nephrostomy opening after ureteral transplantation the lower ureter can be flushed from above in the natural direction and, if necessary, its lower end gradually dilated by passage of catheters through the nephrostomy opening. In this treatment, of course, catheters should be drawn on through the rectum and not back by way of the nephrostomy opening. Hinman has used preliminary nephrostomy in two cases of advanced tuberculosis of the bladder, in which renal function had dropped, but it was not possible to demonstrate tuberculosis of the remaining but progressively atrophying kidney. Although the patient was in a very weakened condition and transfusion had to be done before nephrostomy, the intestinal transplantation two weeks later occasioned no reaction and convalescence has been uneventful. In the other case the kidney was drained for almost three months through the nephrostomy tube in order by putting the bladder at rest to promote healing. But there being no improvement, the ureter was finally and successfully implanted into the rectum. Hinman says it would hardly be indicated to perform nephrostomy in all cases in which ureteral transplantation seems indicated.

THE PRODUCTION OF CEREBRAL AND VISCERAL HEMORRHAGE IN THE YOUNG RAT*

AN EXPERIMENTAL STUDY. PRELIMINARY REPORT.

IRA A. MANVILLE, M.D.
JESSIE LAIRD BRODIE, M.A.
AND
C. ULYSSES MOORE, M.D.
PORTLAND, ORE.

A review of the literature on infant mortality cannot help but impress one with the importance that must be attached to the etiology of hemorrhage in the newborn. Sharpe and Maclaire[1] have made the statement that 9 per cent of all births show evidences of cerebral hemorrhage. Warwick[2] has shown that 50 per cent of all infants coming to autopsy have this same condition and that a large part of these also show hemorrhagic conditions in other viscera. Any measure tending toward the reduction of the infantile death rate cannot disregard this condition as an important contributing factor.

The tendency has been and still is to attribute this hemorrhagic condition to birth trauma. Some inherent condition of the mother or of the young and asphyxia have been ascribed as other causes. We believe, as a result of our work, that we have found this condition to be most intimately associated with the nutritive welfare of the mother. No direct mention of this being a factor has appeared in the literature.

One of the main obstacles of any scientific research is, first, to be able to produce experimentally in animals the condition one wishes to study. In the course of our work a diet was found that is entirely adequate for the growth and nutrition of albino rats, enabling them to reproduce but not to satisfactorily rear their young through the lactation period. Autopsy of the young dying at various ages before weaning almost invariably reveals a condition of intracranial hemorrhage and occasionally shows losses of blood into the lungs, liver and other viscera. This hemorrhagic status was first thought to be an experimental variant but subsequent records showed the microscopic existence of the findings in nearly 85 per cent of the cases. This total represents the findings from twenty-six animals from six litters.

The clinical symptoms associated with these conditions vary in a great many respects, depending upon the location and extent of the hemorrhage. A subnormal temperature, retardation of growth and development and profound anemia are always present. Convulsions, frequently associated with sharp cries, and spastic paralysis of the hind limbs (this latter condition occurs in the fore limbs but is less severe) are present only when the cerebral involvement is marked. Death is usually preceded by a few days of stupor and sleepiness, during which the animal rapidly loses weight. Sometimes death is quite sudden, in which case a most marked and extensive fresh intracranial hemorrhage is found. In these cases the sudden death of the animal makes it impossible to determine whether or not paralysis or the other symptoms enumerated above were present. Fatal hemorrhages have also occurred in the genitourinary, gastrointestinal and respiratory tracts.

In conducting the pathologic study of these cases, we frequently did not wait for death to occur but killed the animals at various stages, in order to determine as far as possible the nature of the progressive development of the symptoms as far as the nervous system itself was concerned. According to the data the animals seem to fall naturally into the following groups:

1. Primary stage. Early hemorrhage, in which there are found numerous small, discrete (punctate) hemorrhages in the cerebral cortex. The location of these hemorrhages for the most part was in the anterolateral portion of each hemisphere.

2. Secondary stage. The hemorrhage has become more extensive. The punctate hemorrhages have become confluent. This condition is associated with cerebral degeneration, in which the portion near the median fissure is the most involved. In general, the area of involvement follows the outline of the choroid plexus lying below, that is, it is crescentic in outline.

3. Tertiary or terminal stage. This group includes two types, one a continuation of the above condition and the other apparently independent of it, in that the hemorrhage is sudden and severe in onset and is the direct cause of death. Both types are undoubtedly due to the same fundamental cause but one is fulminating and the other insidious in character.

(a) Insidious type. This is a continuation of the above condition and includes those cases showing an extensive involvement of the cerebral hemispheres and sometimes of the spinal cord. Anemia, subnormal temperature and spastic paralysis are associated with this group.

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* From the Department of Physiology and the Collin's Fellowship in Nutritional Research, University of Oregon Medical School.

(b) Fulminating type. This includes those cases which developed hemorrhage suddenly and is generally accompanied by convulsions, cries, twitchings and paralysis.

In conclusion we feel that the only statement justified by the present status of our work is that we are able to produce experimentally a hemorrhagic condition which seems to be analgous in many respects to that found in infants showing the hemorrhagic diathesis. Further work is under way not only to corroborate the above findings but also to determine, if possible, the necessary nutritive additions.

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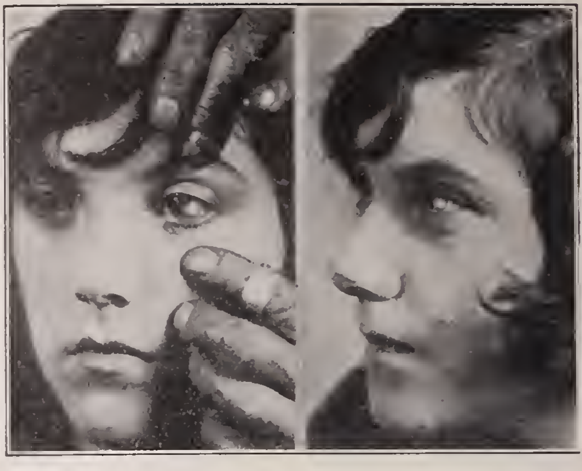
DERMOID TUMOR OF THE CORNEOCONJUNCTIVA

REPORT OF A CASE

A. B. Dykman, M.D.
PORTLAND, ORE.

Dermoid tumors arising from the conjunctiva are not uncommon, and many cases have been reported in the literature. They are congenital defects which not infrequently are associated with other abnormalities of development, such as coloboma of the eyelids, cleft palate, hare lip, etc. The most frequent site of occurrence is in the lower, outer quadrant of the eyeball, but they are also seen in the transition folds of the lids.

Many theories have been advanced in explanation of this type of abnormality, chief of which are Ryba's theory of incomplete closure of the lids, with cornification of the conjunctiva, Ramak's theory of fetal invagination of the external blastoderm, and the theory of VanDuyse that they are caused by adhesions of the amnion to the surface of the eyeball in a very early period of fetal life. Fuchs calls them islands of skin upon the surface of the eyeball. Mayou refers to this deformity as an aberration, caused by sequestration of the portion of the surface epithelium along the line of the orbitonasal fissure and also as a failure of the eyelids to bud out in a whole or a portion of their extent, in this latter case also accounting for other defects such as cryptopthalmia and coloboma of the eyelids. Most textbooks of pathology classify dermoids as true teratomas, but Bland-Sutton refers to dermoids of the conjunctiva as conjunctival moles, as in the main they contain cuticular elements only. This would seem particularly applicable to the case reported below, as numerous cutaneous moles were observed about the face and neck of the patient.



CASE REPORT

W. W., female, age 18. Apparently normal, healthy young woman. No history of any defects of development in other members of the family. Parents had noted at birth that there was a tumor mass attached to the left eyeball and protruding between the lids. No advice had been sought as to the nature of this.

Examination revealed a circular, yellowish-white, cone-shaped tumor, 7 mm. in diameter at the base and 3 mm. high, astride the limbus in the lower temporal quadrant of the left eyeball. It was firmly attached to the cornea, but only penetrated the superficial layers and encroached upon it for a distance of 3 mm. There was a well marked semi-lunar opacity, 1 mm. wide, surrounding the corneal portion of the tumor. In its conjunctival attachment over the sclera, the mass was slightly movable. The tumor was soft, as if of fatty consistency, and could be pitted with a probe. Near the apex of the cone was a circular 2 mm. strip, containing many fine blood vessels. The center of the cone showed many papillae similar to the papillae of the skin and from which several fine brown hairs protruded. The vision of this eye, with a correction for a moderately high hyperopic astigmatism, was 5/6 partly.

It might be of interest to note that the right eye showed a moderate degree of conical cornea, in which vision could not be improved beyond 5/20. Due to parental objections, operation for removal of the tumor was refused so that opportunity for histologic study was denied.

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NORTHWEST MEDICINE
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Devoted to the interests of the Medical Profession of the Pacific Northwest
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EDITORIAL

COLLEGE OF HEALTH EXAMINATION AND EFFICIENCY RESEARCH

Physicians are preventing disease more every day. Most people, however, do not see a doctor professionally until sick or disabled. If only the people could be educated to seek advice before they are incapacitated, preventive medicine rather than curative medicine would keep the physician busy. Assuring health or preventing disease is the coming system which is founded on economic merit. It is far easier for an earning patient to pay a regular fee than for a sick one to pay a large bill out of his savings account. Most active persons have an income of some kind and should be willing to pay a small fee to be assured that they can continue activity. Only live patients can pay their bills, so that an added five year life expectancy resulting from an early recognition and treatment of disease is an economic advantage to the doctor as well as to society. Physicians do not practice medicine primarily to accumulate wealth, but they should be assured an adequate respectable living.

"Periodic health examination" has become a popular slogan with the uplifter, the welfare worker, the state worker, the city worker and the civic worker, and somehow they have talked about everybody but the family practitioner, while as a matter of fact he is the man to whom the task belongs. Bear in mind that our public activities relative to the health of a community are naturally dividing themselves into two economic needs: one, our duty as physicians, and the other our public duty toward the community. We cannot be physicians and not be sympathetic to a lower death rate and preventive medicine, to discovering the present clinical signs of disease and keeping people out of trouble. The state and city have recognized this; they have their laboratories and boards of health.

This examination is designed to reveal any departure from normal, the correction of which could in any way improve the welfare of the individual. Its purpose is to ascertain any physical defect or disease condition that may exist in order that intelligent advice with regard to personal hygiene and medical treatment may be prescribed. The average individual presents numerous physical defects. It is a rare thing to find a perfectly sound individual. All defects should be noted and comment made on their significance. It is the cumulative effort of various physical disorders and of error in living habits that are responsible for premature breakdown and premature death. Most of these are either preventable or at least postponable. It is the purpose of these examinations to prevent premature disability and to improve the average condition of each period of life.

Health examination should be made by appointment only. This is in every way desirable both for the individual and the physician because of the necessity of spending not less than one hour with each examination. Every person desiring an examination should make out the history blank beforehand. The physical examination should take place in a well lighted office or room designed especially for this type of work. The individual should be carefully questioned about his past and present physical condition, special inquiry about any serious illness, injury or operation he may have had. The examination should be carried out with the utmost care, in order that no defect may be overlooked and unnecessary disability be prevented. There should be a regular routine for conducting examinations. The examination form should be followed, as it indicates under each head the line of investigation to be followed. The applicant should then strip to the waist for the examination of the heart, lungs, and abdomen, and further disrobing attained with the progress of the examination. Make reports brief, concise and precise so that data can be correctly interpreted.

In order that approved methods for examination of apparently well persons be facilitated it is proposed to select a faculty from the members of the Oregon State Medical Society who have shown themselves competent for making physical examinations in a creditable manner. They will organize a "College of Health Examination and Efficiency Research," to be known as the C. H. E. E. R. They will first qualify by being examined themselves and agreeing to be examined annually. Team work will be used for giving instruction and demonstration examinations before classes and medical societies. A postgraduate course of instruction will be open to all members of the society, provided that they agree to be examined themselves and to take a course of instruction in making thorough examinations. Particular care will be used in selecting instructors who have demonstrated their ability to do this work well. When a member of the Society has completed one hundred examinations and filed his case records with the college, his application for fellowship will be considered. If the records are approved and the advice given by him satisfactory, the faculty can then elect him a fellow. It is necessary, however, for every fellow, member and student to go on record, stating he will be examined annually. This movement is to be popularized by practical demonstrations before local medical societies. It is of the utmost importance that every physician interested should not only be examined annually himself, but should make every effort to see that the members of his family also use this privilege. We would then be able to demonstrate to the public that we are not only taking our own medicine but are placing ourselves and our families in a position to enjoy longer life and better health.

THE AMERICAN COLLEGE OF PHYSICIANS

With the evergrowing demarcation of internal medicine as a particular line of work, there has developed a personnel interested in this specialty. In former years internists have been limited largely to the leading teaching centers and, therefore, represented a small group of men concerned with problems of internal medicine as applied to teaching. Quite naturally these men drifted into small scientific organizations devoted to their special interests. With the development of internal medicine as a specialty of wide distribution, with well qualified representatives in every city, even those of small population, the need of a national organization of internists developed. This need was filled by the American College of Physicians, organized twelve years ago for well qualified internists, determined to develop the specialty in accordance with high ethical and practical standards, and to hold annual congresses of internal medicine. The progress of the organization was interupted by the war but was revived in 1919.

The twelfth Congress was held in Detroit, February 22-26, with an attendance of a thousand members and many visitors, it being the most successful in the history of the organization. At the convocation a class of over one hundred men took the fellowship pledge and signed the roll. The scientific program consisted of papers and clinics, among which the outstanding contributions were those of Prof. Knud Faber, Copenhagen, on "The Intestinal Origin of Pernicious Anemia," and Jacques Forestier, Aix les Bains, on "Technic and Results of the X-Ray Examinations of Respiratory Cavities with Iodized Oil." One of the events of the Congress was the day spent at Ann Arbor at the new University Hospital, with clinics, lectures and addresses, notable among which was one by President Littel. Among the scientific exhibits the most interesting was that of a new portable electrocardiograph, based upon a principle which does away with the troublesome string in the Einthoven instrument.

At the business sessions a new and more liberal constitution was adopted, amalgamating the American Congress on Internal Medicine with the American College of Physicians, by providing for associates in the College for men who had not qualified for full fellowship. Dr. Alfred Stengel was reelected president and Dr. Frank Smithies, president-elect. The Pacific Northwest was given representation on the Board of Regents by the election of Dr. Noble Wiley Jones of Portland. Northwest Medicine wishes the College of Physicians success and continued growth, and hopes that the internists of the Northwest will interest themselves in this valuable organization.

SPOKANE PROGRAM FOR PACIFIC NORTHWEST MEDICAL MEETING

Plans are well advanced for the program of the Pacific Northwest Medical Association which meets in Spokane, July 1-3. A very fine list of speakers has been obtained by the program committee. The following men have consented to participate.

Dr. Charles R. Stockard, Professor of Anatomy at Cornell University Medical School will give three lectures. (1) Inheritance and Environment, (2) Development and Environment, and (3) Rational Anatomy.

Dr. A. C. Ivy, Professor of Physiology at Northwestern University Medical School will give three lectures. (1) Recent Advances in the Physiology of Gastric and Pancreatic Secretion. (2) The Relation of the Gastrointestinal Tract to Anemia, and (3) A Review of the Recent Advances in Physiology.

Dr. George Dock, formerly Professor of Medicine at Michigan, and Washington University at St. Louis, will give three lectures. One will be on the anemias, one in the form of a clinic and the third on a subject not yet announced.

Dr. J. Whitridge Williams, of Johns Hopkins Hospital, will give three lectures. (1) The Toxemias of Pregnancy, (2) Cesarean Section, and (3) Peuperal Infection.

Dr. Arthur Steindler, Professor of Orthopedic Surgery at the University of Iowa, will give three lectures. (1) Scoliosis, (2) Low Back Pain and (3) The Arthritic Knee Joint.

Dr. George W. Holmes, Radiologist to the Massachusetts General Hospital, will give three lectures. (1) The Roentgen Examination of the Chest, with Special Reference to the Heart and Great Vessels, (2) Bone Tumors; Their Classification and Roentgen Appearance and (3) The Present Status of Radiation Therapy.

Dr. H. L. Parker of the Mayo Clinic will give two papers on Neurology, titles not yet announced.

Dr. Charles A. Elliott, Professor of Medicine at Northwestern University Medical School, will give two lectures, subjects not yet announced.

Dr. Howard Lilienthal, Professor of Clinical Surgery at Cornell University Medical College and Consulting Surgeon at Mt. Sinai Hospital and Bellevue Hospital, New York City, will give two lectures, (1) Extrapleural Thoracoplasty in Tuberculosis, (2) Pulmonary Suppuration.

Dr. J. B. Collip, Professor of Biochemistry at the University of Alberta, Edmonton, Alberta, will give three lectures, (1) The Parathyroid Gland, (2) Certain Interesting Points in Relation to Other Ductless Glands and (3) The Application of Blood Chemistry to Clinical Medicine.

Dr. Walter E. Dandy, Associate Professor of Clinical Surgery at Johns Hopkins, will give two lectures, (1) The Diagnosis of Brain Tumors, (2) The Surgical Management of Brain Tumors.

Dr. A. W. Adson, Mayo Clinic, will give two lectures, (1) The Diagnosis and Surgical Treatment of Raynaud's Disease, (2) The Present Status of Surgery on the Sympathetic Nervous System with Reference to Spastic Paralysis and Angina Pectoris.

Dr. George H. Semken, of the New York Skin and Cancer Hospital, will give three lectures on surgery in carcinoma, titles not yet announced.

Dr. Howard C. Naffziger, Associate Professor of Clinical Surgery at the University of California Medical School, will give two lectures on clinical surgery, titles not yet announced.

Dr. Albert Keidel, of the Department of Syphilology at Johns Hopkins University, will give two lectures on subjects not yet announced.

Dr. E. H. Mason, of the Metabolic Clinic of the Royal Victoria Hospital, will give three lectures on metabolic subjects, titles not yet announced.

This will be the best meeting the Pacific Northwest Medical Association has yet held and is by far the best program that has been submitted. A large attendance is expected, as the first meeting of this organization in Spokane was well organized and it is hoped that this will be equally well managed.

SANIPRACTIC PERSISTENCE

It will be remembered that a bill was introduced before the recent session of Washington legislature for the purpose of establishing sanipractors on a legal basis which would have substantially given them the rights and privileges of doctors of medicine. The bill met its death on the floor of the Senate, a result to be expected from the expose a few months previously of the sanipractic diploma mill in Seattle, whose charter was revoked by the department of licenses. The same individuals who presented that measure are now striving to obtain the necessary 40,000 signatures for an iniative bill to come before the voters at the fall election, which will reestablish this discredited sanipractic "university" and reinstate those practitioners whose licenses were revoked in consequence of their origin from the diploma mill. A state-wide campaign in opposition to this bill would be a profitable opportunity for instructing the public regarding the advantages of scientific medical training, in opposition to these various forms of half-baked methods of treating the sick, as represented by the more or less popular cults which exist in such numbers in our western states. Further details of this proposed initiative bill will be found under the heading, Public Health Leagues.

NEW ADVERTISEMENTS

Attention is called to the following new advertisements appearing in this issue: San Francisco Polyclinic (page 24) announces a Course in Operative Surgery. University of Bordeaux, France, Post Graduate School offers a course in Oto-Rhino Laryngology.

MEDICAL NOTES

Residual Effects of Warfare Gases. At the request of the American Legion and other agencies General Frank T. Hines, director of the U. S. Veterans' Bureau, upon the recommendation of Dr. Crossman, Medical Director, has appointed a Board of Medical Officers to conduct an investigation and make an intensive study of the residual effects of warfare gases. The members of this Board are:

Dr. A. K. Krause, Member of the Group on Investigation and Research of the Medical Council of the Medicine at Johns Hopkins University.

Lt. Col. Harry L. Gilchrist, M. C., U. S. A., Chief of Research Division, Chemical Warfare Service, United States Army.

Dr. Philip B. Matz, Chief Medical Research Subdivision, United States Veterans' Bureau.

This Board held its first meeting March 9, 1926, at the U. S. Veterans' Bureau and it was decided to begin the investigations at once. This will necessitate the study of the present status of some 70,000 men who were gas casualties during the World War, and will extend over a period of twelve to eighteen months.

Outside of the knowledge obtained from experimental work on animals very little is known about the remote effects of the various war gases on the body economy. This investigation is purely a scientific one, the findings of which will be not only of clinical value to the ex-service men and the Veterans' Bureau, but is being looked forward to with a great deal of interest by some of the other governmental departments.

Medical Women's National Association. The twelfth annual meeting of the Medical Women's National Association will be held at Dallas, Texas, April 18-19, in connection with the meeting of the American Medical Association. Women planning to attend this meeting should make reservations through Dr. May Agnes Hopkins, Medical Arts Building, Dallas, or at the Baker Hotel, headquarters of the meeting. Terms for railroad transportation may be obtained from the American Medical Association Journal. All medical women, whether members of the women's association or not, are cordially invited to participate in this meeting.

OREGON

Hospital Addition Dedicated. The addition to Manuel hospital, Portland, built at a cost of $270,000, was formally dedicated last month. This is of concrete construction, five stories in height, 160 by 100 feet. It presents the latest construction and arrangement in hospital plans. It contains 63 private rooms, beside 26 rooms for two or more patients. The hospital is under the management of the Swedish Lutheran Church.

Hospital Assured. Signing of the deficiency appropriation bill by President Coolidge assures the item of $1,350,000 for the erection of the Veterans' Hospital at Marquam Hill, Portland. It is expected that construction will begin very soon. Multnomah county has already graded a new road to reach the location of the new buildings.

Campaign for Hospital Funds. The Pacific Protective Society, of Portland, is sponsoring a movement throughout the state to raise $60,000 for the completion of the Juvenile Hospital for Girls. This has been a part of the work of the Louise Home fo the past sixteen years. The hospital is located nea Troutdale on a twenty-two acre tract. It will accommodate fifty patients.

Gift for Tuberculosis Work. The Oregon Tuberculosis Association has had presented to it a gift of $10,000 by the Oregon agents of the New York Life Insurance Company. It consists of policies of $1000 each on the lives of ten men, making the association their beneficiaries. This gift is presented to the association in recognition of its work in decreasing the tuberculosis death rate in Oregon.

Physician Goes to Penitentiary. Dr. R. B. Craver, of Klamath Falls, has been sent to McNeil's Island penitentiary to serve a two years' sentence on conviction of violating the narcotic law.

Dr. Vernon A. Douglas, who has recently practiced at Vernonia, has moved to Salem. He will be connected with the Marion County Child Health demonstration clinic.

Dr. Marshall Woodworth has located for practice at Albany. After graduating from medical school, he has been in hospital work for the last three years in Portland, as well as in railroad construction in this state.

Dr. George Smith, who has recently practiced in North Dakota, has located for practice at Ashland.

Dr. S. D. Snook, who has recently practiced at North Powder, has located at Philomath.

Dr. C. L. Ogle, who has practiced for some time in New York State, has located for future practice at Grant's Pass.

WASHINGTON

New Medical Arts Building. Plans have been completed for the construction of a Medical Arts Building, at Yakima, to cost $250,000. It will be a ten-story building of attractive design. There will be a garage in the basement for the use of tenants in the building.

New Tuberculosis Building. The Pierce county commissioners have let a contract of $28,075 for the construction of a new building in connection with the county tuberculosis sanatorium at Lakeview. A modern heating system will also be built for the benefit of the institution.

New Hospital to be Built. An addition to cost $50,000 will be constructed for the Oakhurst tuberculosis sanatorium at Elma. The new addition will be a separate wing for the accommodation of male patients. This will bring the capacity of the institution to sixty-five patients.

In Charge of Hospital. Dr. Paul R. Carter has been appointed chief medical officer of United States Veterans' hospital No. 59 (Cushman) at Tacoma, to succeed Dr. W. R. Leverton, resigned. Previous to his association with this hospital, Dr. Carter was district medical officer at Seattle.

Picturesque Proceeding. Last fall Arthur E. Webb, a prisoner at McNeil Island penitentiary, was released from that institution. His cell-mate had been Dr. R. E. McKibbon, formerly of Seattle, who was serving a term for narcotic violation. On his release Webb got possession of the doctor's property, including diploma, state license, fraternity emblems and personal papers. Thus equipped he proceeded to practice medicine in different cities. He encountered Government officials in Alaska in consequence of forging checks on the doctor's account. Consequently he is again occupying his former quarters at McNeil Island. He was able to impersonate a physician by reason of formerly being a chemist and having knowledge of Latin formulas.

Wholesale Vaccination. During the past month the smallpox situation in Seattle created a lively interest in vaccination. Although during the first three months of the year there were some eighty-five cases, the death rate was more than twenty-five per cent. It was estimated that 100,000 persons were vaccinated, which would seem to insure a decrease of smallpox during the coming years.

Reformatory Physician. Dr. Millard Allison, of Monroe, has been appointed physician to the state reformatory at that city. He succeeds Dr. H. K. Lum, who died recently.

New Superintendent at Steilacoom. Dr. C. A. Taylor, of Tacoma, has been appointed superintendent of the Western Hospital for the Insane at Steilacoom. He succeeds Dr. David L. Livingstone, who recently resigned.

Dr. W. R. Leverton, commander of United States Veterans' Hospital No. 59 (Cushman) at Tacoma, has resigned from this position. After special study in physiotherapy work in the East he will take charge of the physiotherapy department of Tacoma General Hospital.

Appointed Health Officer. Dr. C. E. Abegglen was appointed health officer for Colfax last month, being elected by the city council. There were several candidates for this office.

Appointed Chief of Hospital. Dr. Mitchell Langworthy has been appointed chief of the Shriners hospital for crippled children in the state. He takes the place of Dr. C. F. Eikenbary, resigned.

Elected President. Walla Walla County Tuberculosis League held its annual meeting March 9. Dr. G. H. Taggard was reelected president for the ensuing year.

Commissioned Colonel. Dr. H. V. Wurdemann, of Seattle, was recently commissioned Colonel, Medical Reserve, United States Army.

Dr. David Livingstone, who has resigned as superintendent of the Western Washington Hospital at Steilacoom, has located at Centralia where he will resume practice.

Dr. James H. McGranahan, who has recently been attached to the United States Navy, at Bremerton, has resigned from that position and has located for practice at Monroe.

Dr. J. B. Beeson, who has practiced for a number of years at Anchorage, Alaska, has located for practice at Seattle.

Dr. J. H. McCormack, of Ellensburg, has sailed for Europe where he will spend a year in eye, ear, nose and throat work.

Dr. W. N. Nelson, who has practiced for the past five years in Detroit, has located in Seattle, where he will practice in the future.

Dr. R. O. Adams, who has practiced for many years in Illinois, has recently moved to Langley, where he will practice for the future.

Dr. E. C. Wessels, who has been located for some time at Colfax, has moved to Los Angeles, where he will continue to practice.

IDAHO

New County Hospital. It is proposed to erect a county hospital at Weiser to cost $25,000. It will be one story, brick and concrete structure, 32 by 84 feet. It will accommodate from fifteen to twenty patients. This section is much in need of an institution of this sort.

Campaign Against Spotted Fever. The United States Public Health Service has recently been conducting a campaign against spotted fever in Idaho, under the direction of Dr. R. R. Parker, of Montana, aided by Dr. R. R. Spencer, of Washington, D. C. The work was started in the vicinity of Shoshone. Dr. Parker has developed a vaccine against this disease which will be utilized in this campaign. During the past two years about 700 cases were reported in Idaho with about 22 deaths during the past year. The plan is to vaccinate sheep tenders and others committed with the sheep industry.

MONTANA

New Deaconess Hospital. The Deaconess hospital is under construction at Billings, which it is expected will be opened for patients by July. It will accommodate sixty-seven patients. It is being constructed with all modern improvements for an up-to-date institution.

Dr. D. D. Davis, who has been house physician at Murray hospital, Butte, for the past year, has moved to Sheridan county, Nebraska, where he will continue practice.

Dr. N. A. Strickland, formerly of Bisbee, Arizona, and recently of Mammoth, Wyoming, has located at Livingston, where he will be associated with Dr. G. A. Windsor at the Park hospital.

OBITUARIES

Dr. Isidore D. Freund, of Butte, Mont., died in Seattle Feb. 16, aged 79 years. He was born in Berlin, Germany, in 1846. His family came to this country when he was a small boy and located at Port Huron, Mich. He graduated from the literary department of the University of Michigan, where he also received his medical degree in 1872. He practiced in several towns in Northern Michigan until 1893, when he located in Butte, where he was connected with the Murray and Freund hospital. He was one of the well-known surgeons of Montana, and took an active part in the upbuilding of that state. He was prominent in local and state medical affairs.

Dr. Harry K. Lum, of Monroe, Wash., died Feb. 15, after an illness of about ten days, aged 64. He was born in Rahoboth, Conn., in 1862. His family moved to Kansas in 1864, where he spent his boyhood. He studied at Oberlin College, Ohio, and in the State Agricultural College. He obtained his medical degree at the University of Michigan in 1885, where he was instructor ot anatomy and physiology for three years. He practiced in Ann Arbor until 1900, when he moved to Stanwood, Wash. In 1904 he located at Monroe. In 1908 he moved to the East returning to Sultan in 1913, later again locating at Monroe, where he practiced until his death.

Dr. Charles Loeding, of Portland, Ore., died March 22, aged 42 years. While at his country place near Brightwood, he was riding on a tractor which capsized and crushed him producing death in a short time. He was born at Elgin, Ill. He moved to Portland in 1900 and devoted his time to a chicken ranch. He graduated from the University of Oregon Medical School in 1912 and then spent three years as interne at Good Samaritan hospital.

Dr. John D. Cleveland, of Merrill, Ore., died March 1, from internal injuries sustained from a fall, in January, while returning from a call on a patient. He was 65 years of age. He was a resident of Iowa until 1925, when he moved to Merrill.

Dr. Mary M. Huntley, of Puget, Wash., died March 3, aged 65 years. She was born in Elliottville, N. Y., in 1862. Twenty years ago she moved to Puget Sound region. She purchased a tract at Puget, later known as Sunny Beach, which has been her home during this period.

Dr. August Madsen died at Leavenworth, March 17, of pneumonia, aged 29 years. He was recovering from an attack of scarlet fever when he contracted influenza, which resulted in pneumonia. He was physician to the Great Northern Railway's tunnel camps at Berne. His home was at Wayne, Neb.

Dr. W. D. Valentine, of Spokane, Wash., died March 20, aged 74 years. He has practiced in Spokane since 1884.

REPORTS OF SOCIETY MEETINGS

OREGON

PORTLAND CITY AND COUNTY MEDICAL SOCIETY

Pres., T. H. Coffen; Secty., K. H. Martzloff

A meeting of Portland City and County Medical Society was held at Portland Hotel, Portland, Ore., March 3. In the absence of Dr. Coffen, Dr. S. Stearns presided. Minutes of the previous meeting were read and approved.

Dr. C. S. Sears presented two cases of acquired hemolytic icterus. These patients were particularly interesting in that both showed signs of biliary obstruction, as a consequence of which there was found bilirubin in their urine and the stools of one had been acholic at times.

Application for membership of the following doctors were read, having been approved by the board of censors: Drs. L. T. Jones, A. E. Kidd and Guy Via.

The first paper was on "Spinal Anesthesia in Major Abdominal Surgery," by Dr. Carl H. Bastron. He described the technic of spinal anesthesia and its particular indications for use. The discussion was opened by Dr. Norman Pease, followed by Drs. J. Earl Else and Pettit.

Dr. J. Earl Else read a case report and presented a specimen with lantern slides of a Carcinoma of the Ampula of Vater.

The occurrence of a recent epidemic of smallpox in Seattle was described by Dr. John G. Abele who gave a demonstration of the method of vaccination in use in the city health department. Before the demonstration had closed practically all of members present had submitted to inoculation.

WASHINGTON

LEWIS COUNTY MEDICAL SOCIETY

Pres., R. H. Campbell; Secty., Rush Banks.

Lewis County Medical Society held a meeting at Chehalis, March 8, at the Citizens' Club rooms.

Dr. J. Tate Mason, of Seattle, read a paper of "Ulcers of the Stomach." Dr. George Dowling, of Seattle, read a paper on "Protective Medical Legislation for the General Public." The papers were discussed by several members, of whom there was a large attendance.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. F. Todd; Secty., W. B. Penney

The regular meeting of the Pierce County Medical Society was held at United States Veterans' Hospital No. 59, Tacoma, March 9, 1926. Minutes of the last meeting read and approved.

A communication from Drs. Yocom and Curran was read in regard to certain contract doctors offering an inducement of 50 per cent reduction in services to families. This communication was ordered made a special order of business for the next meeting.

A report of the following recommendation of the Trustees was approved by the Society: That at each meeting the name of any member be read who has been reported to the Secretary as carrying paid advertising, contrary to the by-laws of the Society.

The following program was given by the staff of the hospital:

Clinic on Upper Abdominal Conditions, Illustrated by Cases, Drs. W. O. Manion and H. J. Whitacre; Report of Case of Adenocarcinoma of Adrenal, With Extensive Pleural Metastases, Dr. George E. Pfeiffer; Report of a Case of Acute Anterior Polioencephalomyelitis, Dr. F. J. Ernest.

A motion of thanks to the staff of the hospital was unanimously carried, after which a delicious lunch was served by Colonel Leaverton and his staff.

PUGET SOUND ACADEMY OF OPTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., J. T. Dowling; Secty., M. J. Morris

The monthly meeting of Puget Sound Academy of Ophthalmology and Oto-Laryngology was held at Virginia Mason Hospital, Seattle, March 16. Dr. Chase called the meeting to order at 8:00 p. m.

Dr. Klemptner presented a man, age sixty-one years, who for the past eighteen years has had a superficial ulceration of the right ear. It involves the external canal and most of the pinna. Discharge is profuse, serosanguinous. The edges are not undermined nor sloping and there is no induration. Wassermann negative. Diagnosis, rodent ulcer.

Dr. Wurdemann showed again the man, thirty-six years of age, with congenital cataracts which he presented to the December meeting. He has had six discissions of the left lens, the media of which eye are now clear. All were made subconjunctively with the Graefe knife without entering the vitreous. The visual acuity with plus 9 equals plus 2.00, 105°, now equal to 6/10, add plus 3.00 Jl.

Dr. Wurdemann also presented two other cases. One a man twenty-eight years of age who was operated upon one week ago for symblepharon of the right eye, caused by a burn from lye nine months ago. On June 5, 1925, sliding conjunctival flaps were made, infolding of the symblepharon to line lid. At the last operation all the scar was excised and a piece of mucous membrane three cm. long and two cm. wide was taken from the lower lid and fitted to cover the denuded eyeball. Result so far seems to show that the plastic will remain and take the place of the bulbar conjunction.

His third case was one of glaucoma, treated five years by myotics and subsequently by trephining. A double trephining was done five weeks ago. Vision now is 6/12 Sn and Jl with correction. Since his operation the patient has been tending to his business and it is believed that progress of the disease has been stopped by the establishment of anterior drainage.

Dr. Chase presented two cases of tuberculous laryngitis. The first was a nurse with a greatly edematous glottis, both vocal cords being healthy. The other, a Jap whose principal involvement was in the glottis with ulceration. The latter had shown much improvement under local treatment with ultra violet light.

The paper of the evening was read by Dr. Hamilton Stillson, Seattle, on "The Relation Between Audition and the Circulation of Blood in the Head." After reviewing the anatomy and physiology of the various parts of the auditory apparatus, he said that certain conditions which cause variation in pressure of the cerebrospinal fluid will disturb hearing through its influence on the vestibular nerve. It must be evident from these observations that disturbances of audition formerly held to be from purely local causes may really be from disturbances of the general circulatory system.

Dr. Stillson's paper and work was highly complimented by the president, also by Drs. Maxey, Davies and Harter who discussed the paper.

A resolution of congratulation was adopted and sent to Dr. Edward Jackson of Denver in commemoration of his seventieth birthday.

A letter was read from Dr. L. Webster Fox, stating that he could not be the guest of the Academy this summer, as it is improbable that he will be in Seattle.

The president called attention to the good work of the new Program Committee, which consists of Drs. Conner Gray, Chairman, Francis Brugman, Seattle, and A. W. Howe, Tacoma.

SEATTLE ORTHOPEDIC SOCIETY

The annual meeting of the Seattle Orthopedic Society was held on March 13 and 15. The Society was honored by having as its guest Dr. Paul B. Magnuson of Chicago. Dr. Magnuson is the noted authority on bone subjects, is the originator of the use of ivory in bone surgery and has done a great deal to popularize this method of internal fixation in the treatment of bone injuries.

The meeting opened on the morning of March 13 with a dry clinic in the amphitheatre of the Medical-Dental Building. This was conducted by Dr. Magnuson and many cases were presented by members of the medical profession of the Northwest. It was given over entirely to the discussion of back cases.

The annual dinner was held in the Italian room of the Olympic Hotel on the evening of March 13 and proved to be not only instructive but entertaining. Drs. Hills, of Walla Walla ,and Louis Maxson and Walter Kelton featured the musical program. The sensation of the evening was the spectacular appearance of the questionable young lady who insisted on having Dr. Magnuson examine her for "backache." This entertainment was cleverly done by Mr. O'Donnell. The paper of the evening, given by Dr. Magnuson, was most illuminating and brought out many instructive points, not only in regard to the etiology but the newer methods of treatment.

On the morning of March 15 the dry clinics conducted by Dr. Magnuson were given over to showing of cases of fractures of the extremities. The evening meeting was held in conjunction with the King County Medical Society. Dr. Magnuson gave an excellent illustrated talk on "Common Sense Treatment of Fractures." Dr. Magnuson's talks and dry clinics were the best that have ever been given on fractures in the history of the Pacific Northwest and the Society is greatly indebted to him.

SNOHOMISH COUNTY MEDICAL SOCIETY

Pres., O. A. Thomle; Secty., A. P. Duryee

Snohomish County Medical Society held its monthly meeting in the Medical and Dental Building, in Everett, March 2. A paper was read by Dr. A. P. Duryee and Dr. S. L. Calbick described a recent visit to the hospitals in San Francisco.

SPOKANE COUNTY MEDICAL SOCIETY

Pres., R. M. Hamblen; Secty., R. L. Rotchford.

Spokane County Medical Society held a meeting, March 11, at the Old National Bank assembly room.

Dr. D. V. Trueblood, of Seattle, read a paper on "The Treatment of Burns with Paraffin," describing its use by which scarring and distortion of tissues was lessened. Dr. Robert Stier read a paper on "Pollen Treatment of Hay Fever." He described the successful use of this treatment in the Northwest.

IDAHO

CANYON COUNTY MEDICAL SOCIETY

Pres., H. P. Ross; Secty., R. G. Young.

A meeting of Canyon County Medical Society was held at Nampa, March 10. A large number were present also from Caldwell.

The program included an address by Dr. Faust, of Boise, medical advisor for the department of public health, who is also serving as public health officer.

The following resolution was passed: "Be it Resolved that Canyon County Medical Society goes on record as favoring a full-time health officer and requests the aid of the state department of public welfare in securing such officer."

An address was given by the state bacteriologist describing the work of the laboratory in controlling contagious diseases.

MONTANA

NORTHERN MONTANA MEDICAL SOCIETY

Pres., O. P. Narral; Secty., M. D. Ridle

Physicians of Pondera, Glacier, Teton and Liberty counties met at Shelby, March 12, and organized the Northern Montana Medical Society.

The following officers were elected: President, Dr. O. P. Narral, Cut Bank; vice-president, Dr. G. F. Tidyman, Valier; secretary-treasurer, Dr. M. D. Ridle, Shelby. There were eight physicians in attendance from adjacent cities.

PUBLIC HEALTH LEAGUES

WASHINGTON

Sanipractic Referendum Looms in Washington

It is quite possible the voters of Washington will be given the opportunity of passing on a clear-cut health issue next November, if the sanipractors are able to muster 40,000 signatures to an initiative petition now being industriously circulated over the state. This petition is based on two bills which were introduced at the last session of the legislature. Despite a numerous lobby and much glib conversation as to the need of such legislation, this cult made no progress at Olympia. One of the measures died peacefully in a House committee and the other met a summary fate in the Senate by being quickly tabled without the formality of any discussion on the floor.

LYDON BUSY

Defeated by the legislature, the sanipractic contingent, headed by the redoubtable John E. Lydon, the for-a-while president and general business manager of the American "University" of Sanipractic, purposes now to carry the issue to the voters. If ten per cent of the qualified voters at the last election sign the petition, then the defeated measure at Olympia becomes a part of the ballot next November.

WHO'S WHO

Lydon appears to be the principal leader in this effort to pass one of the most destructive health measures in the history of Washington; one which will once and for all time smash standards of education and training, so far as license statutes are concerned. Mr. Lydon, or should we say "doctor" Lydon, as stated above, operated the business end of the American "University" of Sanipractic. The *sales end* of the organization developed so much more rapidly than the educational end that the attention of the Attorney General of the State was called to it. Charges were then made, in connection with a suit to dissolve the said "university" by this state official, that diplomas were being sold at prices ranging from $3.75 to $500.00. Attendance at the school or study there seemed to be only for the purpose of signing the necessary checks and receipting for diplomas, which were later translated into full-fledged licenses from the State of Washington.

The court at the conclusion of the suit dissolved the school and disconnected the active Mr. Lydon from the presidency and an easy payroll. Later came the passage of the bill through the legislature making possible the revocation of something like 90 licenses to practice "full" (this has no reference to the Volstead Act) sanipractic.

PAPER INDUSTRY BOOSTED

Now Mr. Lydon, who can successfully pose as a booster for home-made products, having used so many reams of Washington print paper in the manufacture of diplomas, would restore full rights to these who would call themselves "doctor" on the basis of fraudulent diplomas. In addition he would, out of the generosity of his "presidential" heart, throw in the right to carry on general medical practice as well!

The measure desired, if it should become a law, would mean the following:

1. A separate board of examiners, apart from the drugless healers' board.
2. Examinations would be conducted by the Secretary of State instead of the Director of Licenses, where all such tests are now conducted.
3. The restoration of the licenses of those 90 sanipractors, whose rights to practice full sanipractic were revoked because of fraud, in connection with the "diploma mill" expose.

4. The examination would include the following subjects and give power of healing practice therein: Anatomy, physiology, hygiene, pathology, kinesiology, food science, urinalysis, herbology, general and special diagnosis, chemistry, toxicology, obstetrics, hydrotherapy, radiotherapy, physicotherapy, electrotherapy, heliotherapy, first aid, gynecology, all subjects in their relation to sanipractic, its principles and practice.

5. The use of drugs is permitted, with the exception of serums, vaccines, toxins, antitoxins or poisons.

THE LEAGUE ACTIVE

The officers of the League are making preparations to carry on a comprehensive campaign of publicity to combat this referendum. Its true nature, the attack it involves on adequate educational standards and the disaster to the public interest which would result will be fully presented to the voters in due course. It can be predicted that the influence of the organization will be sufficient to badly defeat such a dangerous proposal.

IDAHO

Credit Association

The members of the Public Health League have established a bureau for the purpose of disseminating credit information to its members. When a person moves from one locality to another, leaving an unpaid bill, the members are notified of his past record. The establishment of this bureau has been the means of solving one of the physician's hardest problems. The work so far accomplished has proven highly satisfactory, according to letters received from the members throughout the state.

Dr. E. D. Piper of Jerome, who has been a member of the League since its inception in 1921, has accepted a position on the medical staff of U. S. Veterans' Bureau Hospital No. 86, at Sheridan, Wyoming.

Annual Meeting

The Public Health League will hold its annual meeting at Sandpoint, September 2-4, in conjunction with the annual meeting of the Idaho State Medical Association.

Compensation Disputes

The League officers have handled thousands of dollars worth of disputed claims before the State Insurance Fund during the last three years. The Insurance Manager has at times assumed an arbitrary attitude in cutting claims that has resulted in a bitter fight between the physicians and the fund. The League Secretary has saved the physicians many thousands of dollars in the handling of claims.

Fee Revision Meeting

Conditions having reached a climax, the Industrial Accident Board called upon all the physicians of the state to attend a meeting at the State House, February 11. The League and the State Association called a meeting for February 10. As a consequence, many things were worked out and the medical men presented a solid front in presenting their side of the case.

After a general meeting with the Board on February 11, a committee was elected to work out the matter. The committee elected consisted of Drs. J. L. Stewart, Boise; C. C. Conant, Weiser; D. L. Alexander, Twin Falls; Alexander Barclay, Coeur d'Alene; D. E. Cornwall, St. Maries. At 2:30 this committee met with a like number from the Insurance Carriers of the state, and elected Dr. J. L. Stewart chairman. At 5:30 this committee of ten reported to the Industrial Accident Board that they had considered various schedules and had decided upon the Utah schedule as a basic or skeletal schedual most adaptable to Idaho's needs, but that it would be necessary to revise and amplify it.

The committee met again at 7:30, remaining in session practically all night. The general committee met the Industrial Accident Board at 9:30 a. m., February 12, remaining in session with them until 11:30, when the members from the northern part of the state were compelled to take their train home.

A subcommittee of five was then appointed to work out further classification and complete the schedule. Drs. J. L. Stewart, C. C. Conant and D. L. Alexander and W. D. Yager, State Insurance, and A. M. Waters, Aetna, were selected on this committee. It is thought that this subcommittee will complete its work sometime early in March. The completed schedule will then be submitted to the Industrial Accident Board for its approval.

MEDICAL RESERVE CORPS

ASSIGNMENTS OF MEDICAL RESERVE CORPS OFFICERS

The following-named Medical Corps Reserve officers are attached to the units as indicated below and to the positions within the units as indicated after their respective names:

To Hospital Center No. 23, Zone of the Interior. Headquarters:

Lieutenant Colonel Horace M. Francis, 1st National Bank Bldg, Corvallis, Oregon, as Neuro-psychiatrist.

Lieutenant Colonel Harry J. Huene, 1091 Main St., Forsyth, Montana, as Roentgenologist.

Lieutenant Colonel Isaac W. Powell, 513 High St., Bellingham, Washington, as Urologist and Dermatologist.

To General Hospital No. 46, Communications Zone:

Major Ralph C. Matson, 1021 Corbett Bldg., Portland, Oregon, as Executive Officer.

Major Everett Mingus, 971 Commercial Ave., W. Marshfield, Oregon, as Assistant to Chief of Medical Service.

First Lieutenant Roland Allen, Multnomah County Hospital, Portland, Oregon, as Medical Ward Officer.

To General Hospital No. 50, Communications Zone:

Major Le Roy Jones, U. S. V. Hosp. No. 85, Walla Walla, Washington, as Executive Officer.

Major Paul J. Lewis, 408 Masonic Temple Yakima, Washington, as Assistant to Chief of Medical Service.

Captain John J. O'Leary, 118 18th Ave. West, Olympia, Washington, as Medical Ward Officer.

To General Hospital No. 139, Zone of the Interior:

Lieutenant Colonel Walter C. Belt, 133 N. Flint St., Roseburg, Oregon, as Chief of Medical Service.

Lieutenant Colonel Everett O. Jones, 1007 Medical & Dental Bldg., Seattle, Washington, as Chief of Surgical Service.

Major Ruben H. Fields, 1243 Patterson St., Eugene, Oregon, as Executive Officer.

To General Hospital No. 141 (Barnes), Zone of the Interior:

Lieutenant Colonel James T. Arwine, U. S. V. Hosp. No. 72, Fort Harrison, Montanan, as Chief of Medical Service.

Lieutenant Colonel Robert L. Owens, 46 Higgins Block, Missoula, Montana, as Chief of Surgical Service.

Major Claire D. Hopper, Kennewick, Washington, as Assistant to Chief of Medical Service.

Major Frederick M. Poindexter, 6 S. Idaho St., Dillon, Montana, as Executive Officer.

To General Hospital No. 143, Zone of the Interior:

Colonel Samuel E. Lambert, 726 Summer Ave., Spokane, Washington, as Commanding Officer.

Lieutenant Colonel Francis W. Anderson, 602 2nd St., South Bend, Washington, as Chief of Medical Service.

Lieutenant Colonel William L. McClure, 508 Masonic Temple, Yakima, Washington, as Chief of Surgical Service.

Major Duncan L. Alexander, 1305 Poplar Ave., Twin Falls, Idaho, as Assistant to Chief of Surgical Service.

Captain George W. Beach, U. S. V. Hosp., Walla Walla, Washington, as Medical Ward Officer.

Captain Roscoe L. Ghering, 204 Peyton Bldg., Spokane, Washington, as Surgical Ward Officer.

To General Hospital No. 144, Zone of the Interior:

83rd Evacuation Hospital, 3rd Army:

Colonel Archie C. Van Cleve, 595 E. 17th St., N. Portland, Oregon, as Commanding Officer.

Lieutenant Colonel Joseph A. Pettit, 401 Selling Bldg., Portland, Oregon, as Chief of Surgical Service.

Lieutenant Colonel John J. Sellwood, 1694 E. 13th St., Portland, Oregon, as Chief of Medical Service.

To Station Hospital No. 137, Communications Zone:

Major Frederick T. Hyde, 116 N. Laurel St., Port Angeles, Washington, as Chief of Surgical Service.

Captain Lilburn W. Renfro, 400 Bigelow Bldg., Seattle, Washington, as Medical Ward Officer.

To Station Hospital No. 138, Communications Zone:

Major Max R. Charlton, 604 E. 66th St., N. Portland, Oregon, as Chief of Medical Service.

Major Edward H. McLean, 1103 Washington St., Oregon City, Oregon, as Chief of Surgical Service.

Captain Seth M. Kerron, Osburn Apartment, Eugene, Oregon, as Medical Ward Officer.

Station Hospital No. 140, Communications Zone:

Lieutenant Colonel Ralph Hendricks, S. 1212 Oak St., Spokane, Washington, as Commanding Officer.

Major Lee W. Chilton, 412 McCarty Bldg., Boise, Idaho, as Chief of Medical Service.

Station Hospital No. 141, Communications Zone:

Major Leland Frazier, 1008 8th St., Rupert, Idaho, as Chief of Medical Service.

Station Hospital No. 143, Communications Zone:

Lieutenant Colonel Vestal R. Abraham, Butter Bank Bldg., Hood River, Oregon, as Commanding Officer.

Station Hospital No. 148, Communications Zone:

Lieutenant Colonel Karl J. Swenson, 635 E. 8th St., Portland, Oregon, as Commanding Officer.

70th Surgical Hospital, 6th Army:

Lieutenant Colonel William J. Pennock, 218 Coeur d'Alene St., Spokane, Washington, as Commanding Officer.

Major Edward F. Ziegelman, 2734 60th St., S. E., Portland, Oregon, as Chief of Surgical Service.

Hospital Train No. 65, Zone of the Interior:

Major Claude L. Armstrong, U. S. V. Hospital No. 77, Portland, Oregon, as Commanding Officer.

Captain Charles L. Williams, 409 E St., McMinnville, Oregon, as Surgical Service.

Hospital Train No. 69, Zone of the Interior:

Major Riden R. Hamilton 687 Clackamas, Portland, Oregon, as Commanding Officer.

Hospital Train No. 72, Zone of the Interior:

Major Abram M. Newton, Kane Building, Pocatello, Idaho, as Commanding Officer.

Hospital Center No. 23, one of the Interior:

Headquarters:

Lieutenant Colonel Frank R. Mound, Bank of Commerce Bldg., Oregon City, Oregon, as Medical Consultant.

Major Claude M. Pearce, 315 Selling Bldg., Portland, Oregon, as Oto-laryngologist.

Major Willis D. Butler, 2534 Sutherlin St., North Bend, Oregon, as Evacuation Officer.

Major Prince C. Page, 961 Bertha Ave., Portland, Oregon, as Assistant Medical Inspector.

Headquarters 349th Medical Regiment, IX Corps Troops:

Lieutenant Colonel Joseph H. Sayer, 6307 15th Ave. N. E., Seattle, Washington, as Executive Officer.

Major Henry H. Slater, Main and Second St., Deer Park, Washington, as Plains and Training Officer.

Captain Otto E. Schoenfield, 10103½ Woodland Park Ave., Seattle, Washington, as Adjutant.

Headquarters Collecting Battalion 349th Medical Regiment IX Corps Troops:

Major Elmer G. Braddock, 1103 8th Ave., Lewiston, Idaho, as Battalion Commander.

Headquarters Hospital Battalion 349th Medical Regiment, IX Corps Troops:

Captain Arthur G. Tullar, Kennewick, Washington, as Adjutant.

The following-named reserve officers are relieved from assignment as indicated:

Captain Charles H. Manlove, Jr., Med.-Res., 1559 E. Stark St., Portland, Oregon, is relieved from assignment to 83rd Evacuation Hospital 3rd Army.

Major Albert F. Longeway, Med.-Res., 505 3rd Ave. N., Great Falls, Montana, is relieved from assignment to Station Hospital No. 141, Communications Zone.

Major Houston H. Parsons, Med.-Res., P. O. Box 196, Sidney, Montana, is relieved from assignment to Hospital Train No. 72, Zone of the Interior.

The following-named reserve officers are assigned as indicated.

Major William W. Brand, Med.-Res., Court St., Prosser, Washington, to 85th Evacuation Hospital 3rd Army, as Assistant to Chief Surgical Service.

Major Frank M. Trout, Med.-Res., Malin, Oregon, to General Hospital No. 139, Zone of the Interior, as Assistant to Chief of Medical Service.

Captain Charles S. Edwards, Med.-Res., 21F Main St., Prineville, Oregon, to 83rd Evacuation Hospital, 3rd Army, as Medical Ward Officer.

Lieutenant Colonel William F. Howard, Med.-Res., 302-6 Carlson Bldg., Pocatello, Idaho, attached to Hospital Center No. 22, Communications Zone, as Commanding Officer, Center Laboratory.

Major William P. Barton, Med.-Res., 306 Times Bldg., Portland, Oregon, to 82nd Evacuation Hospital, 3rd Army, as Assistant to Chief of Medical Service.

Major Cecil C. Kellam, Med-Res., Port Blakely, Washington, from assignment to 426th Hosp. Co., 34th Medical Regt., IX Corps Troops, and assigned to General Hospital No. 50, Communications Zone, as Medical Ward Officer.

Major Harry B. Moore, Med-Res., 402 Stevens Bldg., Portland, Oregon, from assignment to 425th Hospital Co., 349th Medical Regt., IX Corps Troops, and assigned to Evacuation Hospital No. 83, 3d Army, as Assistant to Chief of Medical Service.

Major Elmer Garfield Braddock, Med-Res., 1103 8th Ave., Lewiston, Idaho, from assignment to Bn. Com. Hq., Coll. Bn., 349th Medical Regt., IX Corps Troops, and assigned to Evacuation Hospital No. 85, 3d Army, as Assistant to Chief of Medical Service.

Major George E. Low, Med-Res., Coquille, Oregon, from assignment to 425th Hosp. Co., 349th Med. Regt., IX Corps Troops, and assigned to 349th Med. Regt., IX Corps Troops as Battalion Commander, Collecting Battalion.

Major William E. Joiner, Med-Res., 1929 1st Ave. W., Seattle, Washington, from assignment to 426th Hosp. Co., 349th Med. Regt., IX Corps Troops, and assigned to Hospital Battalion, 349th Medical Regt., IX Corps Troops, as Battalion Commander.

Major Albert Forrest Longeway, Med-Res., 505 3d Ave. N., Great Falls, Montana, to General Hospital No. 145, Zone of the Interior, as Assistant to Chief of Surgical Service.

Captain Charles Henry Manlove, Med-Res., 1559 Stark St., Portland, Oregon, to Evacuation Hospital No. 83, 3d Army, as Laboratory Officer.

Major Houston Haddon Parsons, Med-Res., P. O. Box No. 196, Sidney, Montana, to Surgical Hospital No. 66, 3d Army, as Operating Surgeon.

First Lieutenant Bertram R. Shoemaker, Med-Res., 135 Blakley St., Roseburg, Oregon, to the 412th Field Artillery, 188th Artillery Brigade, XIX Corps.

12. Captain Harry Thornton D'Arc, Med-Res., Anderson Bldg., Mount Vernon, Washington, is relieved from assignment to Station Hospital No. 147, Communications Zone.

First Lieutenant Albert J. Bowles, Med-Res., 883 E. Taylor St., Portland, Oregon, from the 82nd Evacuation Hospital, 3d Army, and assigned to the 349th Bombardment Group GH, as Flight Surgeon.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Facts on the Heart. By Richard C. Cabot, M. D., Professor of Medicine and Social Ethics, Harvard University. Octavo of 781 pages with 163 illustrations, Philadelphia and London. W. B. Saunders Company, 1926. Cloth, $7.50 net.

The work of Richard Cabott is very interesting and important because he always has very positive and original ideas and these are based on incontrovertible evidence, i. e., postmortem findings. This was notably so years ago in his work, comparing the diagnosis of nephritis in the Massachusetts General Hospital with the results found at autopsies on the same patients, where the clinical diagnosis was correct in only 16 per cent of cases of acute Bright's disease. He has since revolutionized our ideas of many diseases by similar comparisons of diagnoses by the ablest clinicians with corresponding autopsy findings of eminent pathologists on the same subjects. But when he compares the necropsy records of some 1906 cases, the work of Drs. James H. Wright and Oscar Richardson, pathologists at the same hospital, with clinical diagnoses of heart lesions, his conclusions are paradoxical in reference to myocarditis. This word myocarditis is obnoxious to Dr. Cabot as a diagnostic term. It can only be properly used when changes, usually increase of connective tissue, are found in the heart muscle after death and there is no positive means of determining the existence of such changes in the heart muscle during life. He denies that the electrocardiogram can enlighten us, that arrhythmias can do it, that the presence of a large heart can help us, or any symptom whatsoever. This follows because the pathologist finds comparatively few cases of myocarditis in those so diagnosed during life. Thus, in 465 cases of manifest heart disease (with chronic passive congestion postmortem), he gives the autopsy findings as follows: Valvular disease 36 per cent, hypertrophy and dilatation 50 per cent and myocarditis one per cent. He denotes the commonest cardiac lesion as simple hypertrophy (or hypertrophy and dilatation), composing 71 per cent of all heart cases having single lesions, as shown by autopsies.

This matter is of extreme importance and not a mere question of denomination. Cabot's book deals with facts, facts on the heart. They show that pathologists do not find gross myocarditis in cases so diagnosed by internists. The chief cause of hypertrophy and dilatation is hypertension and his diagnosis is hypertensive cardiovascular disease, or hypertrophy and dilatation of the heart, in the absence of other complications, as arteriosclerosis, nephritis, etc. On the other hand, most clinicians retain the old term myocarditis, referring to middle aged or older persons having enlarged and failing hearts with arrhythmia, passive congestion, systolic murmurs, tachycardia, and usually hypertension, less often with low or normal blood pressure. While we know that many of these cases do not show gross signs of myocarditis postmortem, and on the other hand, that in many cases in which myocarditis is found as extensive fibrous degeneration at autopsy, there is no manifest disease of the heart in life, yet clinically the term myocarditis persists. There may be microscopic connective tissue increase in various parts of the heart, as affirmed by Krehl, or enough to interfere with the conductive system (bundle of His), as described by Aschoff and Tawara, but there is undoubtedly a definite decompensation of the heart without pathologic disturbance in a large proportion of cases, in the absence of valvular lesions. The only weak point in Cabot's nomenclature is that there are many such hearts as he describes without valvular lesions, and with all the other signs and symptoms except hypertension, but this may have previously been present.

The author asserts that fibrous myocarditis is not clinically recognizable but it may only be vaguely suspected when angina is present, and in elderly men with arteriosclerosis, nephritis and hypertension. We have devoted a great deal of space to this subject because myocarditis is still used by most clinicians as a cause of death in the case of these chronically enlarged and failing hearts without valvular defects. Cabot appears to have the logic of facts on his side as usual.

The book studies in detail all the classic lesions of the heart in a most painstaking and interesting manner. Not only are the clinical and pathologic findings in many cases of each lesion described but discussions occur between the pathologist and Dr. Cabot on most points.

In his preface the author very modestly writes, "Very few people should even try to read the whole of this book. I should advise most readers to read the opening and closing chapters, and the summaries at the end of each section, and then to look over as many of the illustrative cases as seem interesting." This is the only part of the book with which the reviewer absolutely disagrees. If anybody takes a real interest in the heart he will find the volume filled from cover to cover with the most practical and interesting matter because it is not theory but facts, as elucidated by the most careful clinical studies of actual patients during life and these then submitted to the knife and last word of the pathologist.

WINSLOW.

A MANUAL OF CLINICAL LABORATORY METHODS. By Clyde Lattridge Cummer, Ph. B., M. D. Associate Professor of Clinical Pathology. School of Medicine, Western Reserve University, etc. Second Edition, Thoroughly Revised. Illustrated with 169 engravings and 12 plates. 548 pp. $6.50. Lea & Febiger, Philadelphia and New York, 1926.

The volume is prepared as a text-book for medical students and as a guide for physicians and laboratory technicians. The subject is well divided. There are 243 pages devoted to the blood, including comprehensive chapters on immunologic and chemical examinations. The simplest apparatus usually gives the most reliable results, as is so frequently shown by the illustrative engravings. One chapter is devoted to bacteriologic methods and another to the examination of numerous specimens of urine in hospitals, insurance offices and industrial plants. Protein sensitization tests are fully discussed with colored plates. The Dick test for susceptibility to scarlet fever and the phenoltetrachlorphthalein method of Rosenthal for estimating liver function are so simply stated that they can easily be applied. The author has used descriptive methods throughout the volume.

MOSIMAN.

THE DISEASES OF CHILDREN. By the Late Sir James Frederic Goodhart, Bart., M. D. Ll. D. Aberd., F. R. C. P. Edited by George Frederick Still, M. A., M. D. F. R. C. P., Professor of Diseases of Children, King College, London, etc. Twelfth Edition. 966 pp. With 68 Illustrations. $8.50. Lea & Febiger, Philadelphia, 1926.

In the preface the author says, "Well for us if we keep our minds open to what is new, but with balanced judgment, critical of old and new alike. Specially is this needful of those, on whom falls the responsibility of editing and revising what was written many years ago. There are facts in medicine which time cannot change; they may be stated anew or stated differently, but facts remain unaltered; truth is not subject to decay and rottenness. With some such thought in mind I have left untouched much that Goodhart wrote some forty years ago, but I have endeavored to incorporate in this work the latest advances in the study of diseases of children, insofar as these seemed to me sound and valuable." Additions and revisions bring most of the material up to date. The advance in our knowledge concerning the etiology of scarlatina and its treatment by antisera is probably too recent to have been included in the present revision.

C. L. SMITH.

PSYCHOANALYSIS AND BEYOND PSYCHOANALYSIS. By Leonard L. Landis, M. D., Formerly Assistant Clinical Instructor at Postgraduate Hospital and the University of New York Internal Medicine Department, etc. 212 pp. American Association of Independent Physicians, 1926.

In reviewing this work one is struck with the title primarily and with not a little curiosity to learn what in the author's mind constitutes the "beyond" in pschoanalysis. In the first few chapters one is given a very elementary survey of Freud's work but the book fails to impress any student of the Freudian

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school with the importance of the wonderful results obtained by his followers. The writer in his introduction leads one to hope that he will discuss the wonders to be unearthed by the pursuit of Freud and then fails to give even a fair outline of the idea of repression and the sex theory. About a third of the book is taken up with a brief discussion of the theories of Adler and Jung and the manner in which they differ from Freud, as well as the similarities in the three methods of treating the neuroses. These chapters are well written and ably handled and show that the author has a thorough knowledge of these writers and their methods. Nothing new or enlightening will be found on the subject of emotions or the study of dreams and, as far as being of advantage toward a better understanding of human behavior, it cannot be considered.

The latter part of the work is purely metaphysical, a discussion and an attempt to prove the existence of a supermind above and independent of individual mind. In attempting to show this the author has recourse to a series of trance-like experiences for which he vouches. The Bergsonian as well as the Kantian philosophies are called into service to substantiate a claim that all life is a constant urge to perfection, when both Darwin and Wallace as well as Spencer left us no doubt of this through their strict biologic investigations. We must not fail to give the author due credit for an attempt at being liberal and for his wish to solve some of the abstruse problems of the subconscious, with which as analysts we are so often confronted. If this book does no more than awaken an interest in the vast field of speculative psychology, it will have served the purpose the author intended. TRACY.

A TEXTBOOK OF PSYCHOLOGY FOR NURSES. By Maude B. Muse, R. N., A. M., Instructor in Nursing Education at Teachers College, Columbia University, New York City. 12 mo of 351 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1925. Cloth, $2.50 net.

The author states that this book is an attempt to present in a simple manner such phases of modern psychology as shall prove useful to the nurse, and may be applied by her to nursing problems. It is designed as a text-book in schools of nursing, as a reference book for nursing courses in universities and for the use of graduate nurses who have not had recent courses in psychology. In this volume are discussed the nature and scope of modern psychology. Several chapters are devoted to the behavior mechanism and various phases of its manifestations. A useful chapter is that on tests and measurements, in which there is a concise and simplified description of the method of ascertaining grades of intelligence. A careful perusal of this book will give one the essential factors of modern psychology.

FOOD FOR THE DIABETIC. By Mary Pascoe Huddleson, Consulting Dietitian. Second Revised Edition. 83 pp. The Macmillan Company, New York. 1926.

The purpose of this book is to give diabetic patients in simple language information of their disease from a dietetic standpoint, that is necessary to carry out their physicians' directions. The publicity following the discovery of insulin has given to the public an erroneous impression of the facts concerning a correct diet as the basis for treating diabetes. This little volume contains detailed directions as to necessary food and its preparation. It should be of assistance both to patient and physician.

PHARMACOPOEIA OF THE UNITED STATES. Tenth Decennial Revision. (U. S. P. X.) By Authority of the Pharmacopoeial Convention held at Washington, D. C., May 11, 1920. Prepared by the Committee of Revision and Published by the Board of Trustees. Official from January 1, 1926. J. B. Lippincott Company, Philadelphia.

The first issue of the Pharmacopoeia was published in 1820. It was instigated by Dr. Lyman Spalding, of New York City, who in January, 1817, proposed to the Medical Society of the County of New York the formation of a National Pharmacopoeia. The plan was endorsed by conventions held by the different state medcial societies of the Union in 1818 and 1819. During the last century a revised edition has been published every ten years. In each edition such changes are introduced as are needed to correspond with newly acquired knowledge of drugs and their actions. It would be superfluous to attempt a criticism or review of a work which is the basis of the practice of pharmacy and the science of medicine. This standard volume should be available to every member of the medical profession who desires authentic information relative to all drugs and their preparations for use in medical therapy.

A BRIEF PHYSIOTHERAPY MANUAL. By Noble M. Eberhart, M. D., Ph. D., D. C. L. Formerly Head of the Department of Physiological Therapeutics, Loyola University, etc. 271 pp. $6.00. New Medicine Publishing Company, Chicago. 1925.

The author of this volume is well known to all physicians who practice physiotherapy, on account of the courses of lectures which he has delivered in various parts of the country. It embodies the substance of these lectures, presenting a description of the different modalities employed, with an explanation of the mechanism of each. Different diseases are taken up, to which these methods of treatment are applicable, with a detailed discussion of the technic in each case. It is a working manual of value in this form of practice.

A MEDICAL FORMULARY. By E. Quin Thornton, M. D., Assistant Professor of Materia Medica in the Jefferson Medical College, Philadelphia. 12th Edition Revised. 352 pp. $2.50. Lea & Febiger, Philadelphia and New York, 1925.

This well-known little volume presents formulae for most of the diseases of mankind, arranged in alphabetical order. With this at his elbow the practitioner can receive timely suggestions for daily practice. This volume has been revised to correspond with the latest changes in the United States Pharmacopea.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho, Montana
and Pacific Northwest Medical Association

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ADDRESS

THE PURPOSE OF THE STATE SOCIETY*

PAUL ROCKEY, M.D., F.A.C.S.
PORTLAND, ORE.

On behalf of the Oregon State Medical Society, at its fifty-second annual meeting, the members and guests are welcomed. The program of the meeting will be proceeded with in due order. The meeting will consist of the association of those present, which is so desirable; and of the papers and discussions, by which a few can-teach and all can learn; and of the important business of the Society, reports of its activities during the year, election of officers, adoption of rules and regulations and formulation of policies.

Before proceeding it would be appropriate to consider the basis, general relations, purposes, possibilities and limitations of such a meeting. Had I the time and talent, I would try to present these to you. It would mean a study of the medical profession, of its place in human affairs and of its universal relations. Lacking such opportunity and ability, I invite your attention for a few moments to the general considerations of the meeting. These are things we all know, and mostly agree about. Apparently they are not always remembered. Certainly they are of greatest importance, for such a meeting is useful or not as we act in accordance with them.

The history of our ancient profession is a part of the history of the world. At present the medical profession ranks with the few greatest professions. Its knowledge is a part of all knowledge. It is carried on by and with humanity that hardly changes, among conditions and institutions that are always changing.

It seems to me that the first and greatest step in medical betterment would be the selection of premedical personnel, admitting to the study of medicine a sufficient number of those most able and adapted. I think the second step is premedical education, not necessarily meaning technical training, on the contrary meaning as much as possible of the best general education. There follows undergraduate medical school instruction, then hospital interneship, then graduate teaching and learning. Formally or informally, all the working days of a physician's life are graduate learning. The special agencies that help him are graduate medical schools and courses, books and journals, association with colleagues and medical societies.

However much or little it may be true that for a while some interests seem furthered by sophistry and propaganda, nevertheless it is in accordance with the traditions of our profession, and the character of the educated gentlemen who mostly make up its membership, and the membership of medical societies, to command the respect and support of individuals, of the public and of legislation by worth. The basis of medical ethics, like the basis of good manners, is experience, fairness and kindness. Real dignity is sensible. There are reasons for conventions. When changing conditions properly result in the modification of formalities, the purpose and the spirit are preserved. It must be possible to meet current sociologic and economic conditions, to extend popular education on medical matters, to promote public health, and to secure adequate medical legislation without departure from ethical standards.

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* President's Address, delivered before the Fifty-second Annual Meeting of Oregon State Medical Society, Portland, Ore., April 1-3, 1926.

It is true that most physicians are supported largely by professional fees or their equivalent. But it is also true that this is a learned and gentle profession, in which such support by fees is only incidental and limited. This must be a profession in which smallness of mind, meanness of spirit, cupidity and vanity are rare exceptions. The purpose of the physician is to save health and life. His services are available to all needing them, regardless of finances.

This is a state medical society. Its theoretical or possible membership includes every regular, reputable, licensed physician in the state. Its actual membership consists of the portion of all these physicians who have become and remain members. They are members of the state medical society through their membership in the component county and district societies. Through the state society they are members of the American Medical Association. The state medical society is the agent and trustee, not only of its actual members but of its theoretical members. It is a part of the whole profession. Its purposes are the purposes of the profession. Its interests are the interests of the members of the profession, present and future, and of the life and health of the people. It is the privilege and the duty of every eligible physician to be a member of the state medical society, and to help in its work. The limitations of its work are those of things as they are, present knowledge, human nature, common sense, people and things, and conditions. The possibilities of its work are as great as the possibilities of our profession.

ORIGINAL CONTRIBUTIONS

CEREBROSPINAL FLUID, NORMAL AND PATHOLOGIC*

A. L. SKOOG, M.D.
KANSAS CITY, MO.
Professor of Nervous and Mental Diseases
University of Kansas School of Medicine

The removal of spinal or cerebral fluid for diagnostic and therapeutic purposes has become fairly well known among certain medical men during the past fifteen years. The value of cerebrospinal fluid studies in syphilis of the central nervous system, and lumbar punctures for the diagnosis and treatment of epidemic meningitis has been an incentive for many medical men to gain knowledge on this subject. New data relative to the physiology, diagnostic methods and therapeutics is appearing every year. Therefore, discourses upon this theme might be attractive to most physicians and surgeons.

Historical. The choroid plexus, which later will be shown to be the chief source of supply of the cerebrospinal fluid, was known during and even before the early Christian era, attested to by the writings of Herophilus, Galen, Vesalius and others. They did not appreciate the function of this gland. Galen, about 131 A.D., considered that the cerebrospinal fluid was the seat of the "animated spirits." Vesalius, about 1541, informed his students that the fluid under consideration acted as a lubricant. Varolius, about 1543, considered the "pump-like" action of the fluid. Willis, about 1621, discussed the relationship of the pineal gland and choroid plexus to the cerbrospinal fluid. Wernicke removed ventricular fluid through a trephine opening. Quincke, in 1872, engaged in some physiologic studies on the cerebropsinal fluid in dogs, performed spinal punctures on these animals.

It may be of interest to note that it was nineteen years later, in 1891, that it occurred to Quincke to perform lumbar punctures for therapeutic purposes in the human being. He is discredited as far as priority for the first spinal puncture in man is concerned, but he was instrumental in beginning the development of the technic of obtaining spinal fluid as it is known today. He introduced an apparatus for measuring the pressure which has been improved upon only to a small extent. He gave serious attention to normal and pathologic pressures.

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* Read before the Thirty-third Annual Meeting of Idaho State Medical Association, Pocatello, Ida., Sept. 3-5, 1925.

Corning performed lumbar punctures in the development of his technic for spinal anesthesia. This work was published first in 1885. Lichtheim, in 1893 to 1895, furnished us with some information relative to the fluid and bacteria contained therein in certain pathologic states. Widal and others of the French school considered especially the cytology, differentiating tuberculosis and syphilis. Wassermann, Plaut and others gave us some valuable serologic data. Nonne, in 1908, and others added to our practical chemical studies.

There is a period covering the last thirty-five years, in which we have had some real knowledge of cerebrospinal fluid. The more general practical utilization of this is limited to the past fifteen years. Now lumbar puncture is performed quite often as a routine. There should be included in our studies the fluid pressure, cytology, serologic and chemical tests.

Physiologic. The source of the cerebrospinal fluid has been an interesting topic for scientific argument. It is believed quite generally now that all or a very large part is secreted by the choroid plexus cells. A very few physicians still insist that this gland secretes none or only a small portion of the fluid. Our contention is supported by physiologic, pathologic, and experimental data in abundance. The choroid plexus cells are large and of the secretory type. They are found in large clusters in the lateral, third and fourth ventricles. If they do not secrete the fluid, then what may their function be? Dandy has performed several extirpation experiments on dogs, demonstrating that the choroid plexus was the chief source of the cerebral fluid. I have had an opportunity of studying one case, in which repeated lumber punctures always showed an extremely low pressure and that only a small amount of spinal fluid was ever obtainable. After two months of clinical observation, an autopsy revealed a destruction of the major part of the choroid plexus cells by syphilis.

The statement has been made that a small amount of fluid is added from the ependyma cells lining the ventricles of the brain. The ependyma cell claim does not rest on the solid ground compared with that of the choroid plexus. I would consider that the physical and chemical characteristics of any possible ependyma secretion might be different from that originating in the choroid plexus. Probably little or no fluid is added from the perivascular channels or mesoblastic tissues.

Cushing, some years ago, demonstrated that a portion of the pituitary gland secretion passes directly through the infundibulum into the third ventricle. The amount of this endocrine material seems to be exceedingly small.

It is even more difficult to demonstrate the route for the exitus of the cerebrospinal fluid. At one time it was held that the fluid escaped by way of the pacchionian bodies. This theory is not tenable at the present time.

Weed has demonstrated that much of the fluid escapes by way of the arachnoidean villi and thence to the lymph and venous channels. Some may be absorbed along the cranial and spinal nerves, making their exit from the cranial cavity and the spinal canal. Most of these studies are based upon methods of injecting various dye stuffs or exceedingly small colored particles into the subarachnoidean spaces and then tracing the paths of egress.

Function. The function of the cerebrospinal fluid is recognized as quite important for the central nervous system, but with disputed points. (1) Its value as a mechanical protection to the brain especially is conceded by all students of this subject. It fills all vacant spaces within the cranial and spinal cavities. The brain and spinal cord really are suspended in this small quantity of fluid. This reduces the danger of concussion from various outside mechanical traumas. (2) Vascular movements are permitted without undue shock to nerve cells. Recall the view of a brain exposed at an operation or by trauma. Each cardiac impulse is transmitted to the cranial cavity with a sudden distinct movement. (3) It aids distinctly in the regulation of the intracranial pressure. Some authorities would consider it plays a role in metabolism and nutrition of the central nervous system, but this function is not on a very firm basis. An internal secretion from the pituitary gland undoubtedly finds its way directly to the subarachnoidean space. Most likely some sugar in the fluid is utilized by the neural tissues bathed. It will be recalled that there is found usually a considerably smaller amount of sugar in the lumbosacral sac, contrasted with the ventricular cavity.

Rate of Formation. There is much uncertainty about the rate of formation. The secretion is continuous. Comparative anatomy here does not aid us greatly, because there is too much difference between the cerebrospinal fluid circulation in man and that even in the higher mammals. The amount secreted during a twenty-four hour period in man has been studied chiefly in cases, where there has been a fracture of the skull and continuous drainage over a long period; and a few cases of rhinorrhea.

I have had an opportunity of observing these secretions in one case where there was a cerebrospinal rhinorrhea through probably a congenital defect in the cribriform plate. Quantities ranging from 100 to 1000 c.c. have been reported. I believe the higher figures would represent a gross error. In pathologic states the secretions might be greatly increased. The rapid exodus of cerebral or spinal fluid would cause a considerable reduction in the tension on the choroid plexus cells. I have concluded that high cerebrospinal fluid pressure, exerting an equal pressure upon the choroid plexus cells, would inhibit more or less their function. The amount of the fluid present varies considerably. An approximate average would range between 50 and 80 c.c. Definite quantities accumulate in the lumbosacral cistern, in the several cisternæ at the base of the brain and cerebral ventricles. The fluid may disappear rapidly from the subarachnoidean spaces and cisternæ postmortem.

Circulation. Is there a cerebrospinal fluid circulation? This question suggests some debatable points. I believe there is a circulation, or possibly we should call it an oscillation. Certainly we cannot compare the movements of this fluid to that of the blood in the vascular system. A number of experiments using india ink and several dye stuffs certainly indicate that the fluids find their way rapidly from the ventricles above downward and reversely from the lumbosacral sac upward to the great cisternæ and subarachnoid space over the cortex, and even into the ventricles and the canalis centralis of the spinal cord. That the fluid is in a continuous state of oscillation can be demonstrated by any one, at the usual lumbar puncture. The intracranial pressure is constantly changing with each cardiac and respiratory movement. With a water manometer one may count the pulse or respiratory rate by observing the oscillations at the top of the fluid in the tube.

Pressure. The pressure of the cerebrospinal fluid is exceedingly important in many cases. In some patients it may be of greater importance than the cytology or a Wassermann test. A critical analysis of the literature shows a wide variation of opinions relative to what constitutes the normal minimum and maximum. I believe that some notions have been based upon erroneous data. Some of the so-called normals may have been pressure readings in pathologic states. I believe that the normal ranges from 90 to 150 mm., water manometer. Many factors may influence the pressure. In some cases there will be noted a decrease of several millimeters, where the patient is changed from the sitting to a recumbent posture. Likewise there may be a mild variation, if the head is changed from a position well bent forward to an erect one. Various strains, such as coughing, sneezing or fear may alter the pressure. The normal pressure in young children is considerably less, varying from about 50 to 90 mm.

Pfaundler gave four component factors in normal cerebrospinal fluid pressure as follows: (1) compression pressure, contained within the fluid itself; (2) hydrostatic pressure; (3) pressure transmitted from the blood stream; (4) elastic pressure, deriving its energy from the elastic subarachnoidean walls. The fourth seems to be the most important. The compression pressure probably should not be considered separately, but as resulting from the other three.

It will be recalled that Quincke published his first memorable report on cerebrospinal fluid in 1872; that nineteen years later there appeared his first publication relative to a lumbar puncture and human spinal fluid in pathologic conditions. He gave normal pressure readings as ranging from 40 to 150 mm., and that 200 must be regarded always as abnormal.

An increased pressure is the rule when there are any deviations from the normal. While there are other possibilities, most of the distinctly subnormal pressures are to be considered as belonging to one of four different groups. (1) A destruction of a large part of the choroid plexus will give low readings because the chief source of supply is impaired or destroyed. I have reported one such case proven by clinical observations and an autopsy. (2) Obstruction of the subarachnoidean space anywhere along the spinal cord by a neoplasm or inflammatory process often is the cause. With a tumor in the spinal canal, it is common to record a pressure of 30 to 80 mm. and after withdrawing only 3 to 6 c.c. have a reduction to nil. The spinal cord tumor frequently produces a characteristic syndrome with the above type of pressure, a xanthochromia, and a greatly increased albumin content. Inflammatory causes would include epidemic cerebrospinal meningitis and other acute meningitides, and a septic process from without extending to the spinal cord. (3) Occasionally a tumor in the posterior fossa located somewhere near the foramen magnum will give a seemingly low pressure. (4) We must include an impaired flow of the fluid by possible error in technic or blocking in the lumen of the needle.

Abnormally high pressures may read from 200 mm. to 1000 or more. The highest recorded pressures are those which have been found in cases of tuberculous meningitis, intracranial tumor and internal hydrocephalus. In the average run of a general practice the largest number of cases with increased pressure will be found in the cerebrospinal syphilis group. In nearly all cases of syphilis of the central nervous system it will be increased, most frequently ranging from 200 to 400 mm. Over 400 is rather uncommon. I have had one case with a recorded pressure of 560 mm. I concluded that this man had a temporary obstruction and blocking to the exit of the ventricular fluid at the foramen of Magendie and accessory ones caused by basilar syphilitic meningitis. In fact, there was a complication of a partial acute internal hydrocephalus, accompanying the syphilis of the central nervous system. The spinal fluid in neurosyphilis may show signs as early as the fourth week, following the first appearance of a chancre. More frequently there is an involvement not earlier than the third month. Undoubtedly the central nervous system is involved in at least 60 per cent of the cases before the end of a course of one year. It is increased in cerebral concussion, the various hemorrhagic accidents within the cranium, brain abscess, acute poliomyelitis and epidemic encephalitis. Epilepsy and several other chronic organic diseases of the brain will present a mild or moderate increase in the pressure during the early period.

Physical Appearance. Normal cerebrospinal fluid appears as a perfectly clear, freely mobile fluid. In fact, a first naked eye view can not distinguish it from pure water. The specific gravity ranges from 1006 to 1007. It might be slightly opalescent in several inflammatory processes or where there is a lymphocytosis of several hundred cells. This may be seen occasionally in acute poliomyelitis. Greater turbidity, especially with a yellowish color, suggests some variety of acute meningitis. In this condition the fluid may become so turbid that the flow through the needle ceases. Erythrocytes in the cerebrospinal fluid may cause degrees of discoloration, ranging from a slightly yellowish tinge to the deep red color of normal circulating blood. Bloody fluid suggests a hemorrhage somewhere in the central nervous system, either from injury or disease. But we must exclude the possibility of trauma to a blood vessel resulting from the puncture, which occurs frequently. Experience and training in technic will reduce to a minimum this possible error. Where discoloration of the fluid appears, collect in two or three tubes.

True xanthochromia occurs in spinal cord tumors and a few other uncommon conditions. We should exclude the possibility of a few red blood corpuscles possibly causing a yellowish tinge. If erythrocytes are present the term xanthochromia should not be used.

Fibrin and spontaneous coagulation, occurring within about thirty minutes after the removal of the fluid, are found in a few acute and chronic inflammatory conditions involving the leptomeninges.

Chemistry. A great deal of excellent research work has been conducted along the lines of chemistry applied to cerebrospinal fluid. The large monograph of Mestrezat, entitled "Le Liquide Cephalo-rachidien" published in Paris, in 1912, discusses profoundly this feature. Only a few more important clinical facts will be considered with some detail. The protein content and sugar constitute the most important chemical reactions from the practical side today. Possibly the goldsol and Wassermann tests should be included in the organic chemistry.

Albumin. A small quantity of albumin is found in all normal cerebrospinal fluid. I have never seen a specimen where it was absent. It is increased in all pathologic states, involving the meninges and the ependyma. It is tremendously increased in suppurative processes and less so in tuberculous meningitis, syphilis of the central nervous system, acute poliomyelitis and epidemic encephalitis. In a blocking of the spinal canal, such as may be produced especially by tumor, there is found a great increase of albumin below the level of the lesion. There are a number of simple tests, any one of which may be used for practical purposes, including boiling, nitric acid and trichloracetic acid.

Globulin. The globulin is a special portion of the total albumin content which is either absent or present in very small quantities in the normal individual. The amount becomes greatly increased in syhpilis of the central nervous system, with even greater quantities in paresis. It is found present in a number of other inflammatory conditions, but as a rule in smaller quantities. The Noguchi or butyric acid, Nonne-Appelt or ammonium sulphate, and Pandy or phenol tests are the ones commonly employed, some biochemical laboratories employing one and others two or three. The Noguchi test is the most sensitive.

Sugar. A reducing substance in the spinal fluid was observed many years ago, and for a time there was some contention as to whether it was caused by sugar, pyrocatechin or other substances. It has been established definitely that it is a dextrose, demonstrated by the polariscope, fermentation, phenylhydrazine and Fehling tests. 0.048 to 0.60 per cent may be considered a fair average normal quantity. There may be seen a wide variation for different individuals with the same disease of the brain or spinal cord. There are no changes in the quantity having a diagnostic significance in syphilis of the central nervous system, acute poliomyelitis, brain tumor, and vascular disturbances involving the brain. Frequently there is a great increase in diabetes. It may be increased mildly in epidemic encephalitis. It is decreased considerably in the acute infectious processes involving the meninges. In tuberculous meningitis there is little or no change. The amount differs somewhat in the various loci of the cerebrospinal fluid system, the quantity being considerably greater in the fluid contained in the ventricles, less being found in the cisterna magna, and a further decrease noted in the lumbosacral cistern. This is in contrast to the albumin which decreases cephalad and increases caudad.

Sodium, potassium, iron, calcium, magnesium, iodin, phosphates, chlorides, sulphates, nitrates, carbon dioxide, urea, cholin, and lactic acid are found in the normal fluid, most of them only in small quantities or traces. Many are either decreased or increased in certain pathologic conditions, but at the present time they have no definite clinical advantages.

Goldsol. The goldsol test is a complex chemical or colloidal reaction which probably gives positive findings only in cases where certain albuminous materials are found in the fluid. It is not hard to set up the test and make the readings, but a reliable and constant solution is difficult to prepare. Lange's original method has been modified slightly by some technicians. The mastic test given to the profession as more simple gives almost the same results as the original goldsol. Benzoin also has been used for this same test. Often there is a difference in the reaction for the varying types of syphilis of the central nervous system. Paresis gives the most profound changes and frequently the first four tubes may show a complete discoloration in the fluid. It is not always certain, as some other meningeal disorders will give reactions similar to syphilis. Multiple sclerosis may give a luetic reaction. I have seen some cases of epidemic encephalitis with a syphilitic type of goldsol curve.

Wassermann. The Wassermann test, using cerebrospinal fluid, is equally valuable compared with that done on the blood serum. However, it is recognized that a larger quantity of the spinal fluid is required. Occasionally a case will be encountered where the blood serum is negative and the spinal fluid is positive. At times a positive reaction may be obtained where we can exclude syphilis definitely. I have seen this happen in brain tumors, encephalitis, multiple sclerosis and a few other diseases of the central nervous system. Again we cannot positively exclude syphilis by a negative report. We should use our judgment relative to making several tests in a few cases.

Cytology. A microscopic study of the cerebrospinal fluid is especially valuable in searching for leucocytes or bacteria. Normal fluid contains no erythrocytes, a very few lymphocytes, no cellular tissues, very little amorphous and crystalline material. For counting the number of cells a Fuchs-Rosenthal counting chamber is preferred. This chamber has a depth three times that of the common white cell counting chamber. Staining the fluid with a very weak solution of gentian violet has quite an advantage. The ordinary white cell counting chamber can be used in an emergency, but is less accurate.

What is the leucocyte count for normal cerebrospinal fluid? This is a debatable question and various figures are given. Some workers will give the normal maximum figure as about eight or ten. This is undoubtedly too high. More frequently you will see reports ranging from about three to six. This, too, I consider an excessive figure. In my own researches and drawing conclusions from quite certain normal cases, such as malingering, hysteria and pure neuroses, I find no normals above two, and usually the count ranges from one to less, the cells being mostly small lymphocytes.

Quite frequently in several chronic organic diseases of the central nervous system, we can find various types of endothelial debris. Neoplastic cells in brain tumor cases are observed rather infrequently.

Bacteriology. Normal fluid always is sterile. The search for bacteria in suspected epidemic cerebrospinal meningitis is highly important. The organism, while usually found intracellular, may be extracellular. Pneumococci, streptococci, staphylococci, the bacillus colli and some other organisms have been found in their respective types of meningitis. Tubercle bacilli are hard to search for. They are more likely to be found in the pellicle which frequently forms in the fluid after standing in a test tube a short time. In very early cases they are frequently not found, but nearly always are discovered in the more advanced stages.

Obtaining Fluid. Sir Victor Horsley, in a personal communication during 1910, stated that it took about twenty years for any new valuable diagnostic or therapeutic measure to become popular in the profession. This is about true for obtaining cerebral and spinal fluid. It will be recalled that Quincke established the modern technic for punctures in 1891. The term Quincke puncture has been used. It is only since about 1911 that lumbar punctures have become popular with medical men. A few other loci for obtaining the fluid are highly important in certain cases. I refer to the ventricular, cisterna magna and dorsal punctures.

The size of the needle selected varies with different operators. The needle and its well-fitting stylet should have a proper bevel and be reasonably sharp. A gold needle should not be used because it can never be sharpened properly. The iridium-platinum needle is popular with some men. The steel needle which is used most frequently should be bent and tested immediately before each puncture. It is a very easy matter for the needle to rust inside, thus becoming weakened, and inviting the undesirable accident of breaking off in the back or spinal canal. The patient may be seated or reclining on one side, but always with his head and knees sharply bent towards each other. Probably in this age it is unnecessary to admonish that the proper aseptic precautions be taken. Cleanse the skin with iodin and alcohol.

Most frequently the third lumbar space is selected. There is no objection to using either the fourth or second. If the first lumbar space is used, there is a little danger that the needle might penetrate the conus of the spinal cord. The needle may pierce the skin exactly in the midline or .5 to 1.5 cm. to the right or left. After penetrating the skin, obtain bearings again, direct the needle slightly upward; and if using the lateral method, also directing the needle towards the median line just enough to penetrate the dura at the proper level. The needle will strike the dura at different depths, depending upon the size of the patient, in a normal adult being about 5 to 9 cm. After our sense of touch has been well trained by much experience with puncture work, we should be able nearly always to feel when the needle penetrates the ligamentum subflavum and again in a very short distance when going through the dura. Then remove the stylet. If an apparatus is at hand, take the pressure reading immediately before more than one or a few drops of fluid have escaped.

Two general types of manometers are employed today. (1) Two or three accurately graduated tubes with ground glass fittings are used for the water method. The end with the beginning of the graduation will fit in a short rubber tube with a Luer metal fitting to connect with the outer end of the needle. The two tubes may be graduated up to 600 mm. I have had this made as a modification of the Quincke apparatus. (2) The mercury manometer consists of a U tube and a scale. The water manometer is more accurate for reading, permits a better interpretation of the oscillations and can be sterilized completely each time. The mercury apparatus is somewhat more convenient. The mercury reading is to water as 1 is to 13.6.

If the pressure is nearly normal, remove only enough fluid for the purpose required. This may be from about 4 to 10 c.c. If the fluid is under increased pressure, we must exercise judgment in the amount to be removed. Frequently there is an advantage in removing 20 to 30 c.c. or even more.

There is practically no danger of death or serious trouble, if the operation is performed carefully, and with a previous clinical diagnosis having been made. The possibility of an infection or meningitis being produced is eliminated by proper technic. It is possible to have a serious hemorrhage by puncturing a vessel. I have never had this unfortunate experience with some seven or eight thousand punctures. The misfortune of breaking the needle can be avoided by having control of the patient and using an instrument in good condition. Pricking with the needle an individual member of the cauda equina will produce a sudden motor reflex or contraction of the muscles supplied by the injured motor root; or a lightning-like pain in the area supplied by the sensory root, if this be touched. Quite frequently one of these roots will float in front of the lumen of the needle and obstruct partially or completely the flow of the fluid. The flow can be reestablished by introducing the stylet and slowly removing same, or rotating the needle 90, 180, or even 360 degrees.

A few sudden deaths have resulted, where the punctures were made in patients having a tumor in the posterior fossa of the skull. If such a condition is suspected, the puncture should be performed not at all or with exceeding care. A lumbar puncture headache is a frequent sequela where the patient is allowed to get up too early. I always insist on at least twenty-four or forty-eight hours rest following lumbar puncture, where a considerable amount of fluid has been removed. When a cephalalgia appears during the operation, it will always cease within a few minutes after the patient is placed in a recumbent posture or with the head even lower than the trunk. Remove the pillows for a few hours. These headaches infrequently may make it necessary for a patient to rest a full week, but never injure permanently nor result fatally.

Diagnostic Value. In a diagnostic way, spinal fluid may be desired to determine a meningitis, its type, or to determine the earliest manifestations of syphilis in the central nervous system and to check up on its progress from time to time. It may give information for differentiating types of neurosyphilis. It is also of some value in diagnosing tuberculous meningitis, acute poliomyelitis, epidemic encephalitis, a transverse myelitis, spinal cord and brain tumors, multiple sclerosis, and other organic diseases of the central nervous system.

As a therapeutic measure spinal fluid drainage is used especially in neurosyphilis of the central nervous system, acute poliomyelitis, concussion and injury to the brain, for temporary relief in some greatly increased intracranial pressure states, acute cases of epilepsy and some less common neurologic conditions.

Ventricular Puncture. The removal of fluid from the ventricles of the brain is employed both as a therapeutic measure and a diagnostic one. In very young children, if the anterior fontanelle has not yet closed, it is reasonably easy to introduce the needle into the anterior horn of either right or left ventricle. The needle used for any ventricular puncture should have its point somewhat blunted. Thus it is less likely to injure any blood vessel in its pathway. In an adult, or where the fontanelles are closed, it is necessary to make a very small trephine opening through the skull. I usually select the occipital region quite well posterior, in that here we have some so-called silent cortical areas, less important to the individual than the frontal lobe. A point about midway between the lobes of the ear and five to seven cm. from the midline may be selected. A 3 cm. long incision in the scalp is made, and a special retractor introduced which not only will keep the edges of the wound widely separated but also usually produces complete hemostasis. To reach the cavity of the posterior horn, it is necessary to introduce the needle about 5 to 7 cm., the same distance as for the anterior horn. We can remove large quantities of fluid from the ventricles without causing a headache. If a great deal of internal hydrocephalus should be present, it is necessary to use judgment about the quantity to be removed. Where a tumor in the posterior fossa exists, there is not the danger of sudden death. In fact, the removal of a goodly quantity of ventricular fluid frequently relieves materially this class of patients.

Ventriculography. Just a few years ago Dandy introduced ventriculography. This necessitates the puncturing of one of the ventricular horns as described in the technic above, and then introducing air into the ventricles. The amount of air introduced should never exceed the fluid removed. Where the ventricles are widely dilated it is advisable to remove 10 to 25 c.c. of fluid, introduce an equal quantity of air, and repeat this several times. I usually introduce a little less air than the total quantity of ventricular fluid removed. This may account for the fact that my mortality rate has been nil. The air introduced is an irritant to the ependyma and produces some manifestations of inflammation for a short time. Some fatalities have been reported. A temperature of 100 to 102 degrees F. for a few days is not uncommon. Normally all the air is absorbed in about five days. It may be necessary in a few cases to remove it shortly after the x-ray plates have been made. Roentgenograms in various positions may be taken. Especially are the lateral, anterior and posterior views to be desired. This permits outlining the ventricles in several dimensions. The air casts a contrasting shadow on the plate. Thus good ventriculograms permit a careful study of the size, shape and position of the lateral and third ventricles. Even the iter and fourth ventricle may be outlined in some cases. It is of much diagnostic value in some cases of internal hydrocephalus. But especially is it important in aiding in the localization of brain tumors.

Cisterna Puncture. During recent years Ayers elaborated a method of obtaining fluid from the base of the brain. A lumbar puncture needle is introduced in the midline at the base of the occipital region, entering the cranial cavity through the foramen magnum. After penetrating the dura, it enters the cisterna magna, where the point of the needle rests between the under surface of the cerebellum and the superior surface of the medulla. This cisterna normally contains several cubic centimeters of cerebral fluid. The chief dangers from this procedure are hemorrhages and trauma to the medulla or cerebellum. With proper skill in the technic there is very little danger from these sources.

No one should attempt this puncture without adequate previous experiences on the cadaver. This method of obtaining fluid is very valuable in a diagnosis or more exact localization of tumors and obstructive lesions in the spinal canal, combined with a lumbar puncture performed at the same time. It also has a therapeutic value, being employed in drainage of cerebral fluid in brain syphilis and for giving serums within the cranium. I have performed numerous cisternæ punctures on one man, suffering from syphilis of the central nervous system, for cerebral fluid drainage, with valuable final results.

Dorsal Puncture. It may be necessary in a few exceptional cases to obtain spinal fluid from the dorsal region. This is somewhat more difficult and great care should be exercised lest the spinal cord be injured by the needle. I have performed successfully dorsal punctures to introduce tetanus serum into the spinal canal, where the extreme rigidities prevented the introduction of the needle in the lumbar region.

RESUME

1. Much valuable knowledge on cerebral and spinal fluid, which can aid in clinical work, is at our command. Many facts now known are utilized by some physicians. But accurate physical, chemical and microscopic data with skillful evaluations can be employed for the benefit of the patient more frequently than is the case.

2. All the known tests for cerebrospinal fluid are not required in each case. First make a clinical diagnosis for every patient. Then we should be able to indicate what tests are required.

3. Bacteriologic examinations in certain cases, using either the microscope or culture methods, may be a big aid for a more exact diagnosis.

4. Cytology may furnish valuable information in the acute and chronic inflammatory pathologic states, involving the leptomeninges, ependyma and bordering neural tissues.

5. Accurate registration of pressure in the lumbosacral sac, cisterna magna and lateral ventricles should be utilized in many more selected cases. For therapeutic punctures it is essential to be able to make pressure readings at any stage of the operation.

6. Thus cerebral or spinal fluid may be removed for (a) diagnosis, (b) therapy, or (c) a combination of the two.

1311 Rialto Bldg.

THE DIAGNOSIS OF INTRACRANIAL LESIONS*

George W. Swift, M.D.
SEATTLE, WASH.

In making the diagnosis of an intracranial lesion one must consider the three most common changes that might develop in the course of a diseased brain, the neurologic, the ophthalmologic and the cerebroventricular changes. It is hard to conceive of a serious intracranial lesion that does not involve one of these three systems, so one should think of the examination from these three standpoints when attempting to make a diagnosis.

In the Northwest one of the large industries is the taking of timber from the forests, transporting it to the mills and stowing it in the ships. All three of these activities contribute, each in its turn, to skull fractures and traumas of the brain tissues. Automobiles, in the Northwest as elsewhere, contribute their quota of skull fractures and traumatized brains. What part these two factors play in the development of brain tumors is questionable. Suffice it to say that practically all intracranial lesions, defective mental development, hydrocephalus, epilepsy and brain tumors, each and all of these, in the course of a history, are connected in some way by the parents or other members of the family with trauma. Hemorrhage of the newborn undoubtedly must be attributed to trauma.

In additon to trauma two diseases, syphilis and tuberculosis, are commonly associated with intracranial lesions. To these must be added a third, arteriosclerosis. These three may be well classified in decades. Before twenty years of age one should consider tuberculosis as a factor in all lesions; between twenty and fifty one should consider syphilis, but beyond fifty arteriosclerosis becomes the predominating factor. To summarize, in taking a history one must consider two great factors: first, that of trauma and, second, that of disease and must evaluate the part that each factor plays in the individual case.

NEUROLOGIC EXAMINATION

The most painstaking neurologic examination is sometimes inadequate to make a diagnosis and yet it is my opinion that in the majority of cases a fairly careful neurologic examination will reveal the diagnosis, at least tentatively. If we are going to advance in the treatment of neurosurgical cases, we must make an early diagnosis and the neurologic changes are the first, as a rule, to develop. It is not necessary to enumerate the various signs in order to outline the changes from the normal in the reflexes of the body in different cases, but it is essential that every practitioner know the seven positive neurologic changes which always mean a true lesion. If we will keep them in mind and, whenever one is found, search for the cause or refer the patient to a competent neurologist so that he may find the cause, we shall at least have done our duty to the patient.

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These seven neurologic changes are as follows: (1) Changes in the pupil of the eye, either inequality of the pupil or fixation, not due to local changes; extremely dilated or extremely contracted pupils. (2) Atrophy of the optic nerve. (3) Paralysis of an ocular muscle. (4) The presence of a Babinski. (5) Unequal or absent knee kicks. (6) Atrophy of a single, or a group of muscles. (7) Reaction of degeneration. All of these do not mean, necessarily, an intracranial lesion, but all of them do mean a pathologic lesion; they are never the result of a functional disturbance.

There is a group of symptoms that may be pathologic or functional. Vomiting, for instance, may be the result of a brain tumor, neurasthenia or even habit. The increased or decreased reflexes of the knees or ankles may be due either to a psychoneurosis (hysteria, neurasthenia), multiple neuritis or a brain tumor. A sudden loss of speech may be syphilitic laryngitis, a true aphasia or hysteria. Dilated pupils may mean atropin poisoning, cocainism, hysteria, irritation of cervical sympathetic, or a third nerve paralysis. Ptosis of the eyelid may mean a third nerve paralysis from syphilis or hysteria. Excruciating pain is frequently hysterical in origin, as well as the result of a true neuritis. Sphincter disturbances, while in the majority of cases signify cord lesions, may be the result of purely functional disorder. Visual field changes and loss of sight may mean either tumor of the brain or hysteria, and sometimes both. Convulsions or spasms, incoordination, tachycardia, hiccough, headache, tremors, insomnia are other symptoms common to both.

Then there are some symptoms that always mean a functional disorder (you are all familiar with them), the stocking and glove anesthesia with well marked borders of skin area, flaccid paralysis with no atrophy, paralysis with no reflex changes.

To summarize the neurologic findings, one might say, if any of the seven positive neurologic signs are found, the physician should recognize the fact that he is dealing with a true pathologic lesion.

OPHTHALMOLOGIC EXAMINATION

An unfortunate fact incidental to the practice of medicine is the inability of the average physician to use an ophthalmoscope. One of the first instruments of precision that the student of medicine must purchase is a stethoscope. Yet one can listen to a heart tone with his own ear, if need be: one can count the pulse or tell a great deal as to the patient's condition. By percussion alone one can outline the heart or cavities within the lung. but one cannot by any other means than the use of an ophthalmoscope examine the brain. The retinal vessels are a counterpart to the cerebral vessels; edema of the brain is manifested as edema of the optic disc; intracranial pressure is practically always indicated in the ocular fundus and some twenty-five of the important diseases show changes in the fundus of the eye, many of which are pathognomonic, and yet the average physician neither owns nor uses an opthalmoscope. The graduate of today has been taught how to use an ophthalmoscope and what the different findings are in the various diseases.

It would be, indeed, difficult to enumerate all of the changes in the human eye that are associated with the individual lesions of the brain and so I must confine myself to a few of the important changes, just as I did from the neurologic standpoint. Here, again, in order to appreciate what these findings are, we must first recognize two factors. The first of these is the factor played by pressure within the cranial cavity, and the second is the location of the centers which control ocular movements. If we bear these two factors in mind, we can easily understand the ophthalmologic changes which are almost diagnostic of intracranial lesions. Under neurologic changes optic atrophy was listed as indicating a positive pathologic lesion and so we need not discuss it from the ophthalmologic standpoint, although it is detected by means of the ophthalmoscope and in the course of an ophthalmoscopic examination.

PRESSURE

Pressure within the cranium may be local or general. If local, this pressure might be so situated as to cause a sudden retardation of the return flow of fluid from the cavernous sinus or ophthalmic vein. In this instance a sudden choked disc would develop. This actually does occur in certain fractures of the base involving the sella; in thromboses of the cavernous sinus; in arteriovenous aneurisms, traumatic in character; and in tumors situated in the temporosphenoidal lobe of the brain. I do not know of any condition that will cause a sudden choked disc except as above enumerated. If pressure is applied gradually (it can never be applied suddenly) in the posterior fossa, as for instance in a cerebellar pontile tumor, a cyst or tumor of the cerebellum, an aneurism of the basilar artery and lastly a thrombus of the lateral or sigmoid sinuses, there develops a retardation of the return venous flow from the superior longitudinal sinus as well as from the straight sinus. At first no change is noted in the eye, but gradually the pressure increases to the point where the return flow from the cavernous sinus, which drains by way of the petrosal into the jugular bulbs, is retarded, thus causing choked disc. I would say, then, that the second class of cases causing choked disc from pressure would be those lesions of the posterior fossa.

Pressure against the superior longitudinal sinus from the frontal region or the parietal region, in order to affect the eyes, must act in an indirect manner. It is inconceivable that pressure against the anterior portion of the superior longitudinal sinus would have any effect whatsoever upon the return flow from the eyes through the ophthalmic vein, the cavernous sinus, the petrosal sinus and the jugular bulbs, until such a time as the general increase of pressure causes indirectly pressure against this return flow. This accounts for the fact that other symptoms precede choked disc in tumors and cysts of the frontal and parietal regions, and, further, why one can have an enormous intracranial hemorrhage without choked disc.

General intracranial pressure acts in an entirely different manner from *local* pressure. A passive congestion of the vessels of the brain, as seen in many cases of trauma, manifests itself as a passive congestion of the ocular fundus, especially of the disc. Experience soon teaches the observer the intimate relationship between these two conditions. If one visualizes a passive congestion of the brain, due to trauma, through the gradual stages of more acute congestion, as seen in the delirium of typhoid and pneumonia, and if one will further visualize a sudden change, as in a terrific intraventricular hemorrhage, due to trauma or sudden rupture, as in a glioma of the opticthalamus, in which case all of the retinal vessels burst, then one can in a measure understand why the finer changes that the ophthalmologist notes are of importance in the unravelling of a great series of intracranial lesions. Localized pressure can be easily interpreted, but general pressure is much more difficult.

The second factor involved is the location of the centers which move the ocular muscles. We must consider a lesion which might irritate one of the nerves that go to supply these ocular muscles, the third, fourth and sixth or one that involves the nuclei of these nerves. The cavernous sinus has coursing through it the third, fourth, the opthalmic branch of the fifth and the sixth cranial nerves; consequently a lesion which involves the cavernous sinus will involve these nerves, resulting in disturbed motility of the eye. Such lesions commonly are aneurisms of the cavernous sinus, arteriovenous in character, aneurisms of the carotid artery, thrombosis of the cavernous sinus, abscesses and tumors of the temporosphenoidal lobe. On the other hand, tubercles and gummas frequently involve the brain stem where are found the nuclei of these cranial nerves. These lesions, due to their position, involve other cranial nerve nuclei, such as the fifth, seventh and eighth. Nystagmus, anesthesia, deafness and facial paresis are associated with disturbances of ocular movements.

Visual fields when properly taken may be of diagnostic value in certain chiasmal disturbances, occipital lobe lesions and some functional disorders.

To summarize, then, the opthalmologic examination may show changes in the ocular fundus of diagnostic importance, or changes in the motility of the eye equally as diagnostic, the one denoting pressure symptom, the other the actual location of the lesion.

VENTRICULAR STUDY

Most intracranial lesions can be diagnosed from the neurologic and ophthalmologic examinations. Frequently, however, there are lesions so situated as not to cause any neurologic or ophthalmologic changes. The symptoms are all subjective in character and the predominating complaint is headache. Sometimes the headache is associated with dizziness; there is, also, occasionally associated with the headache and dizziness a certain amount of nausea and at times a fear of impending danger. In this category we find such diseases as cerebrospinal syphilis, cerebral arteriosclerosis, aneurisms of the basilar arteries, infiltrating gliomas, situated chiefly in the opticthalamus and the frontal lobes, sarcomas of the frontal and anterior occipital lobes, and posttraumatic psychoses with internal hydrocephalus.

These patients go along frequently for years, trying everything in a vain attempt to control the headache, and then suddenly the intracranial pressure increases to such an extent that the symptoms of general pressure predominate, as described above.

It is in this group of cases particularly that positive diagnosis and localization can be made by means of the ventricular study.

The ventricular study is divided really into three parts: (1) The neuroophthalmologic examination, (2) the serologic examination, (3) pneumography. By pneumography is meant the indirect injection of air into the ventricles, followed by x-ray examination. The neuroophthalmologic examination has been described above.

SEROLOGY

The serologic examination is of the utmost importance. The circulation of the cerebrospinal fluid, which Cushing describes as the third circulation, is affected by inflammatory conditions within the cranium, in which case the amount of fluid is increased materially; by obstruction along the course of the fluid from the lateral ventricle down to the tip of the spinal column and backward through the incisura over the cortex, to be finally taken up by the venous circulation in the median longitudinal sinus; by benign tumors which press upon the ventricles, causing a displacement and eventually by forcing out the cerebrospinal fluid into the spinal canal. The changes that are brought about by these various lesions may be changes in the chemistry, changes in the character and number of cells and, lastly, changes in the amount of fluid. The microscopic examination will reveal any change in the cellular condition.

Working with Mr. Gibbs, serologist at the King County Hospital, it has been possible to make a study of the hydrogen concentration of the spinal fluid in a series of cases of various lesions and also to make a comparative study of the sugar content of the spinal fluid. The result of this study is reported elsewhere. Suffice it to say there is no variation of the hydrogen concentration in any diseased condition, 7.6 being the constant finding in all cases; secondly, that the sugar content is materially decreased in the presence of inflammatory conditions, the normal range being from 60 to 80; in tuberculous meningitis dropping to 35 as an average and in purulent meningitis dropping down still further to 0. In a case of epidemic meningitis, carefully studied by Mr. Gibbs, he was able to demonstrate that the concentration of sugar bore a distinct and close relationship to the improvement in the course of the disease, a relapse manifesting itself by a decrease in the sugar content, while the gradual improvement showed a gradual upward tendency of the sugar content.

TABULATION OF 150 CEREBROVENTRICULAR STUDIES

Normal cases	8
Suspected tumors	4
Tumors confirmed	16
Cyst, cerebellar	2
Epilepsy	62
Hydrocephalus	15
Lues	17
Abscess	1
Encephalitis	6
Traumatic psychoses	7
Dementia praecox	1
Spinal cord tumor	3
Microcephalus	1
Arteriosclerosis	2
Birth palsy	3
Defective mental development	2
	150

Suspected tumors (not confirmed by operation)			4
Tumors confirmed			16
Glioma	frontal	1	
	temporal	1	
	thalmic	2	
	occipital	2	
	parietal	3	
	sella	4	
	pontile	2	
	optic nerve	1	
			20

Epilepsy		62
idiopathic	23	
angioma	11	
cerebral atrophy	10	
hydrocephalus	6	
tumor	4	
traumatic	3	
senile	2	
multiple sclerosis	1	
lues	2	
		62

The value of this particular test, then, would be necessarily restricted to differential diagnosis between tumors, tuberculous meningitis and between tuberculous meningitis and purulent meningitis. Other workers have found identically the same results. In a recent article by Stowe a considerable number of cases were reported, in which almost identical results were reported.

The displacement of cerebrospinal fluid manifests itself promptly by a rise in the manometric reading, taken at the time of spinal puncture. The increase in the volume of cerebrospinal fluid likewise raises the pressure. In studying a series of one hundred fifty cases, in which air was used, we were able to demonstrate that an increase in the pressure was followed by an enlargement of the ventricular shadows. Displacements of the shadows revealed the presence of tumor masses, cysts, angiomas, etc., depending upon their location within the cranium. I will show by the slides a series of changes quite common in the various lesions.

CONCLUSIONS

1. The diagnosis of intracranial lesions is dependent upon, first, the neurologic examination; second, the opthalmologic examination, and, lastly, the ventricular study.

2. The neurologic examination reveals the early changes in the great majority of cases and at least gives the clue that, if followed, will lead to a correct diagnosis. As these symptoms are not considered of any importance by the patient, the neurologist does not have an opportunity in most cases to make an early examination.

3. The ophthalmologic examination is second on the list in the development of symptoms, but usually first on the list from the standpoint of the patient, as disturbed vision almost immediately causes him to seek the advice of a physician or oculist.

4. In a large series of cases both the neurologic and ophthalmologic examination are negative and the patient's subjective symptoms cause him to seek relief for headache, dizziness and general fear of impending danger. In this group of cases one must depend upon the ventricular study.

5. The ventricular study comprises the neuro-ophthalmologic examination, serology and x-ray.

6. The serologic changes are cell content and sugar content.

7. The ventriculograms complete the examination and in many instances make the positive localization.

Gentleness in Genitourinary Surgery. Bound up intimately with this question of using genitourinary instruments in a manner that will not bruise the tissues and lay them open to easy invasion of infecting organisms, J. Bayard Clark, New York (*Journal A. M. A.*, April 17, 1926), says, is the larger subject of mental and nervous traumatism through fright, fatigue, fear, shock, apprehension, anxiety, alcohol and general anesthesia. Not a single one of these causes, which play major roles in depression of tissue resistance and pave the way for local infection, can for a moment be lost sight of or forgotten by the urologist bent on attaining a high level of results. By gentleness, we can avoid virtually all the pain in connection with instrumentation. By gentleness, we can overcome the patient's apprehension, which unconsciously closes the external sphincter of the bladder. By gentleness in dealing with strictures, we can obviate splitting the scar and adding to it new fibrous tissue. By gentleness in cystoscopy, we can almost always avoid using anesthetics, which only blunt the patient's sensibility, our surest guide in avoiding traumatism with its many undesirable sequelae. But even with gentleness in genitourinary technic, a desirable state of affairs is not to be expected from those not sufficiently trained and experienced. Genitourinary work is the one thing the young practitioner, as he starts in practice, looks to as his surest financial support.

PAIN AS A SYMPTOM OF DISEASE, PARTICULARLY OF THE NERVOUS SYSTEM*

Henry W. Woltman, M.D.
ROCHESTER, MINN.
Section on Neurology, Mayo Clinic

It is often said that neurologic diseases are rarely encountered in general practice, and I formerly believed this was true. But, of 60,062 patients seen in 1924 at the Mayo Clinic, 6,158 (10.3 per cent) were seen in the Section on Neurology because they presented some problem which required special consideration.

Of the many symptoms which may occur with disease, pain is one of the commonest, and the most alarming. Pain is a symptom from which the patient demands relief. The physician is driven into action, and thus an immediate and, if possible, a correct diagnosis is imperative.

Older writers were impressed by the various kinds of pain, describing about seventy-five varieties, each supposed to be more or less characteristic of a certain disease. We have learned since that almost no pain is pathognomonic; that a given disease may be accompanied by many kinds of pain. Yet pain may be the only symptom and much may be learned by inquiring into it. First, we must bear in mind that pain is a subjective complaint, something we cannot see, something we cannot palpate. This necessitates a cautious interpretation of what the patient has to tell us. Let us remember, further, that men communicate with each other not only through speech, but also, as do other animals, with their entire visceral and skeletal musculature, as set forth so clearly by Darwin. Reading with our eyes what our patients have to tell us through these voiceless media is paritcularly important in dealing with hysterical patients and malingerers. They cannot lie below the lips.

Seven points at least should be determined regarding each complaint of pain: (1) situation, depth and radiation; (2) duration; (3) frequency; (4) character; (5) intensity; (6) progress; and (7) associated symptoms.

HEADACHES

One of the most common sites of pain is in the head. Despite the great frequency of headaches, little is known of their cause, and almost nothing of the subtle mechanism of their production. Probably the first point to be determined in a given case is whether or not the headache is the result of organic disease.

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*Read before the Fourth Annual Meeting of Pacific Northwest Medical Association, Portland, Ore., June 26-July 1, 1925.

Only a few of the cardinal points can be mentioned. Headache may be quite absent in cases of brain tumor, but as a rule it is outstanding and severe. It is often stated that headache due to organic disease, notably tumor, is constant, but I believe that periods of remission are almost the rule; a wholly uninterrupted, long continued headache in a patient not obviously ill usually turns out to be psychoneurotic in origin. The headache of brain tumor is most characteristic when it occurs early in the morning, often at 3:00 or 4:00 a.m., and awakens the patient from sleep. Why it does this so often is not known. The pain of tumors of the spinal cord often exhibits the same behavior. If, also, the patient should vomit precipitately before breakfast or during a meal, with little attendant nausea, and if the pulse should be slow or irregular during the headache, then reasons for suspecting increased intracranial pressure are ample. To the three classical cardinal symptoms of brain tumor, headache, choked disc, and vomiting, should be added a fourth, fully as important, namely, a history of progression. Examination of the fundus should never be neglected, and an x-ray examination of the head is often of value. The prolonged pressure on the bone many times produces digitation of the skull and erosion of the sella, which not infrequently is erroneously interpreted as meaning pituitary tumor. It is seldom that a tumor is sufficiently calcified to reveal its situation directly.

Headaches which follow injury to the head are often persistent and continuous. Some probably result from injury to the cranial contents; many are undoubtedly psychogenic.

REPORT OF A CASE OF POSTTRAUMATIC, PSYCHONEUROTIC HEADACHE

A man, aged twenty-four, complained of headache and loss of memory due to injury. Six months before, the right frontoparietal area was grazed by a 10-pound weight, attached to a cord that was pulled to move an elevator. The accident did not seem serious, but one week thereafter a dull pain appeared in the region injured, and continued during his waking hours; it was relieved by rest, and aggravated by work. During the last few months, mental confusion attended efforts to think; he said that he stammered and couldn't say what he wished to say; he was afraid of insanity, was nervous and irritable; at times his whole body quivered.

He worked as foreman in an ice cream company for three years, and had recently been transferred to less desirable work. In the course of the discussion, he remarked that he had had no vacation for three years; he referred to his boss as a "stingy bastard," and said, "I know him like a book." He claimed that he earned more than $100.00 a month, but did not get it, and said that ice cream work got on his nerves. He referred to his working place as a "damned hole." He was drawing compensation.

It has been said by some ophthalmologists that more than 90 per cent of headaches are due to eye strain. Undoubtedly many patients themselves recognize a constant relationship between the onset of their headaches and the use of the eyes and so consult the opthalmologist directly. For a general type of practice, however, in which patients come because of headache due to any cause, this figure is entirely too high. The consulting ophthalmologists at the clinic believe that the headache may be relieved completely by correction of refractive errors in from 4 to 10 per cent of the cases. Obviously, this does not apply to cases in which headache is the result of organic disease of the eye or the orbit.

The frequency with which patients with brain tumor, migraine, and so forth, have nasal operations, discloses a widespread disappointment with the preordained architecture of the nose. Headaches resulting from sinus infections, structural deformities interfering with the physiologic processes of drainage and ventilation call for appropriate treatment, which is followed promptly by relief. Diagnosis by a competent and skillful rhinologist should precede the treatment.

Malignant tumors of the nasopharynx are more common than is generally believed. The extremely varied and misleading symptoms do not seem to be generally appreciated. Often there are no nasopharyngeal symptoms whatever that would lead to a correct diagnosis.

In one-third of the cases neurologic symptoms appear first. They fall into four groups: (1) the neuralgic type, in which pain is referred to the side of the head, the ear or the face, and often associated with annoying paresthesia; (2) ocular manifestations, in which patients complain of diplopia, blindness, ptosis or exophthalmos (the ocular palsies may be transitory and for months the monosymptomatic expression of a nasopharyngeal tumor); (3) the glossopharyngolaryngeal type, the chief neurologic complaints being dysphagia and aphonia due to palsy of the vocal cords, and (4) miscellaneous manifestations, such as epileptiform attacks, psychoses and the results of metastasis to the spinal cord. These cases emphasize the value of coöperation between the rhinologist, whose expert skill in the examination of the nasopharynx is paramount, and the neurologist and opthalmologist, to whom many of these cases are first referred.

Rheumatic headaches may be persistent and disabling. They are presumbaly caused by an inflammation of the muscles overlying the skull. The pain is usually superficial, dull and often constant. It is aggravated by prolonged tension on these muscles, and by exposure to cold drafts; it is relieved by heat. Local tenderness is usually present. The treatment consists in removal of foci and the application of local hot packs followed by heavy massage.

Headaches due to toxic conditions are not infrequent. They are usually aching in character, bilateral and vaguely frontal or general in situation, more or less constant, and fluctuating in intensity. The appearance of this type of headache preceding an epileptiform seizure demands a thorough search for poisoning by exogenous or endogenous toxins. The seizure of so-called essential epilepsy has no such prodromes; it appears abruptly, with or without a short preliminary aura, and loss of consciousness is instantaneous.

There are two conditions in which nephritic headaches are prone to occur. One is chronic diffuse glomerulonephritis, when there may be considerable retention, as indicated by a high blood urea. The work of Hewlitt, Gilbert and Wickett on the ingestion of large amounts of urea is particularly instructive. The other condition is nephritis with associated hypertension. The headaches of hypertension are rather characteristic. They are usually bilateral, occipital or frontal, tend to occur daily, and what is most striking, they appear early in the morning and usually wear off when the patient gets up and about.

Migraine, or sick headache, is the most prevalent nervous disorder. It is often thought of as headache associated with vomiting, but there is an abundance of other manifestations, such as scotoma, paresthesia, transient paralysis, abnormal vasomotor reactions and psychic disturbance. All or any one of these symptoms may constitute an attack. The seizure may be precipitated by an almost endless variety of factors, such as a late meal, constipation, exposure to wind or light, eye-strain, worry, excitement, or a late Sunday morning sleep, being a part of what the Germans style the Sunday neurosis. This means that the actual cause is wholly unknown and probably rests on some instability inherent in the organism. The headache, if present, may be mild or fully as severe as that of brain tumor; the pain is usually made worse by jarring the head, as in walking or straining, and it is aggravated by light and noises; the pain, even if severe, rarely interferes seriously with sleep; it is very erratic in its situation and appearance. It is wise not to treat any probable hereditary condition exhibiting such protean manifestations by any one therapeutic measure. A simple life and exemplary regularity in all habits are called for.

Headache is often the presenting complaint and the scapegoat of the psychoneurotic. Unless one makes it a point to inquire into the emotional life of the patient, the true situation may be overlooked.

NEURALGIA

The term neuralgia is often a grand but empty term, used to cover a careless examination. Among causes listed in texts, one may find carcinoma of the breast, cancer of the liver and caries of the vertebræ. Neuralgia is relatively rare, and intercostal neuralgia is quite rare.

There are at least two clean-cut clinical syndromes that merit the term neuralgia. Trifacial neuralgia is a sharply cut affliction, whose outstanding manifestation is sharp and flashing pain which strikes in paroxysms lasting half a minute or so, limited exactly to the distribution of the fifth cranial nerve or its branches; it is often precipitated by talking, chewing or touching the face. Between the attacks the patient often converses with lips immobile, and during the seizure rubs his face with sudden energy. Confusion with other types of pain is so rare that a diagnosis of atypical trifacial neuralgia should be made with extreme caution.

Two types of treatment are effective in the control of trifacial neuralgia. Alcohol injections often bring a period of relief averaging nine months. Section of the posterior root gives permanent relief, but should be resorted to only after the patient has suffered so much discomfort that he will accept the resulting anesthesia without objection. The disease was well known to Albinus and Galen, who suggested section of the nerve. Operation was performed by Mareshal, body surgeon of Louis XIV. He, however, thought the seventh nerve was to blame, and left his patient with the face paralyzed and the pain still present. The operation, therefore, fell into disrepute. Sir Victor Horsley first attempted avulsion of the ganglion in 1890. This operation was very dangerous. A neurologic surgeon of one of our large cities once told me that of the first five patients operated on in his community, four died and the fifth was not cured. However, rapid strides were made in the technic, until now the mortality following section of the posterior root is less than 1 per cent.

Exactly the same syndrome, but limited to the ninth nerve, is seen in cases of glossopharyngeal neuralgia. Here the pain flashes between the tonsil and the region of the ear; the attacks are usually brought on by swallowing and are often accompanied by a hacking cough. The appropriate treatment is evidently section of the ninth nerve.

Neuralgia is never accompanied by objective findings of organic disease. In cases of tumor of the gasserian ganglion the pain is often extreme, but it seldom has the flashing characteristics of trifacial neuralgia; it is accompanied by objective sensory disturbances suggesting an organic lesion.

Pain in the face is a common complaint. It may occur with the so-called neuralgic types of migraine. If a patient complains of a drawing, boring, burning, full sensation that is not an actual sharp pain, some unusual condition is present. The senile, arteriosclerotic, psychoneurotic,. and psychotic patients often experience such sensations. The prognosis is poor, and operative measures should be undertaken only with the greatest caution. Parker reports the case of an old woman, aged fifty-nine, who complained of a steady, aching, drawing sensation in the region of the right upper incisors lasting about two years. Local treatment of many kinds had had no effect in silencing the loud and persistent lamentations. She finally remarked that a bug, the size of a bean, was living in the tissues of the right upper gum. No operation had secured the head of the creature. She feared it might leave her gum, descend into her stomach and devour her entrails.

Another woman, aged thirty-four, complained of a severe pain in the region of her right temple, which began seven years before, usually came on suddenly at night, and called for an immediate administration of morphin over a period of about three days. She believed this pain was due to disease of the pelvic organs and insisted on a pelvic operation. It was absent when either she or her husband was away from home. She had been sexually frigid all of her married life and the pain appeared only on attempted coitus.

ABDOMINAL PAINS OF NERVOUS ORIGIN

Since the introduction of the roentgen ray, the diagnosis of abdominal disturbance has reached a remarkably high plane of efficiency and accuracy, particularly with reference to diseases of the gastrointestinal, genitourinary, and hepatic organs. In the diagnosis of certain neurogenic phenomena, such as the visceral crises of tabes, a bit of cotton and a pin must replace the roentgen ray, although we seldom think of using them. We are inclined to think of manifestations of disease as dependent on abnormality of structure rather than on abnormality of function, as is illustrated by Table 1.

The greatest aid in the diagnosis is the history, since the objective examination may be entirely negative.

REPORT OF A CASE OF GASTRIC CRISES OF TABES WITH REPEATED OPERATIONS

A man, aged thirty-six, had had specific urethritis and questionable syphilis at the age of twenty, and at the age of twenty-nine had experienced his first gastric crisis. It awakened him at 2:00 a. m.; appendectomy was performed at 5:00 a. m. Two years later he had had an operation for adhesions. At the age of thirty-two gastroenterostomy had been performed; four years later 15 cm. of "kinked ileum" had been resected, with return of another crisis before the patient left the hospital. The attacks were gruesome in their intensity, and reduced the patient to a groaning, quivering heap.

TABLE 1.

Surgical experiences of patients having syphilitic gastric crisis

Patients	120
Operated on (25.8 per cent)	31
Operations	63
Appendectomy	20
Operations on gallbladder	14
Operations on stomach	12
Operations on pelvis (oöphorectomy 5, salpingectomy 1, suspension 1)	8
Operations on kidneys (Dietl's crisis 1)	3
Removal of adhesions	3
Exploration	2
"Colon reduction"	1

TABLE 2.

Characteristics of typical gastric and abdominal crises*

Sudden onset.
Pain or vomiting, usually both, or only flatulence, extreme nausea and sialorrhea.
Pain usually near the middle line and symmetrical, dull or sharp, aching, cramping, squeezing, gripping, burning or numb.
Intensity, mild or gruesome.
Duration from a few hours to several days, rarely continuous.
Sudden cessation. No intercurrent abdominal complaint unless complicated as by ulcer.
Recurrent; intervals vary widely.
No tenderness on deep pressure, possibly hypersensitivity to light touch.
Usually associated with objective evidence of syphilis.

*Almost always an expression of parenchymatous syphilis of the central nervous system, but may be associated with migraine, angioneurotic edema, and unknown causes in apparently healthy persons.

Examination was negative throughout except for positive Wassermann and Nonne reactions, and 18 lymphocytes to 1 cmm. of spinal fluid.

The characteristic signs of parenchymatous syphilis may be briefly reviewed. Argyll-Robertson pupils react to accommodation but not to light. They are seen in other conditions beside syphilis, notably in encephalitis. If the pupils are also irregular and unequal, they strongly indicate syphilis. Absent patellar reflexes merely indicate an interruption in the reflex arc, but are otherwise not indicative of tabes. Absence of pain on pinching the calf, in the presence of fairly well preserved superficial sensibility, is much more characteristic of syphilis. Another valuable sign, most commonly seen in cases of parenchymatous syphilis, is a delay of pain over tactile sensibility. This is most readily demonstrated by pricking the feet with a pin, when the patient will first say "dull," and follow this by saying "sharp." The chest zone of impaired sensibility is another finding seen most often in syphilis.

A history of lightning pains is of great value. They are characteristic and almost pathognomonic of parenchymatous syphilis of the central nervous system, and are neuralgiform in character, but are rarely seen in the multiple neuritis of diabetic cases, in cases of syringomyelia, and in healthy persons without demonstrable cause. Typically they are: sharp in character, short in duration, as though the patient had been shot through the leg or touched with a lighted cigarette, spot-like more often than lightning-like (the painful spot could usually be covered by a silver dollar; a negro physician who had tabes, compared them to "lightnin bugs"), and severe or mild in intensity, appear in showers, are present usually in the lower extremities, not limited to the region of the joints, and may leave the skin hypersensitive to light touch, but not to heavy pressure.

The treatment of crises is most unsatisfactory. When the spinal fluid shows a high cell count, indicating an active inflammatory process, antisyphilitic treatment often brings relief, but when the fluid reacts negatively, treatment is usually disappointing. Spiller first suggested cutting the pain fibers in the upper dorsal region of the cord, when otherwise intractable pain was encountered. The operation was first carried out by Frazier, and in many instances has been performed for the relief of crises with great success.

In cases of tumor of the fourth ventricle, abdominal discomfort may be the presenting complaint and lead to laparotomy. With encephalitis there may also be a severe and stubborn abdominal pain, which may often lead to operation on the abdomen.

NEURITIS

In the extremities, a painful neurologic condition which first warrants consideration is neuritis. Multiple neuritis is practically always the expression of some toxic condition, either exogenous or endogenous. The underlying pathologic change is a degeneration of the peripheral nerves; in view of this, we should expect disturbances in sensation, motility and reflexes. Paresthesia is usually present, the patient complaining of a tingling, burning, silk-glove or wooden-leg sensation. When present, the paresthesia is continuous, differing in this respect from the parasthesia of vascular or neurotic origin, which may be rubbed away. Objectively there may often be demonstrated an impairment of superficial and deep sensibility. On squeezing the muscles of the limbs, tenderness is usually marked. Weakness, varying in degree to complete paralysis, is often present.

In a systemic intoxication, such as accompanies diphtheria, and arsenic and lead poisoning, the peripheral portions of the limbs are most affected. In some types, such as lead poisoning, the motor system is hardest hit, whereas in other types, such as alcoholic neuritis, the sensory components suffer more. The reflexes are usually impaired or abolished, but, in contradistinction to tabes, this condition is associated with marked tenderness. Vasomotor and trophic disturbances are common.

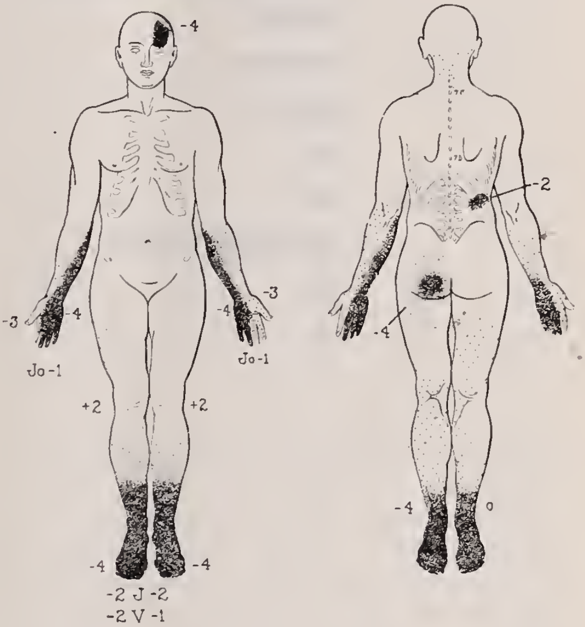

Fig. 1. Neurologic findings in a case of leprosy with multiple neuritis.

In leprosy there is often a scattered infiltration of superficial nerves, with consequently a patchy distribution of the anesthesia (fig. 1). There is usually no pain or tenderness, and palpation often discloses hard, cord-like nerves. The leonine facies with the hairless brows, large nose, and heavy, nodular chin,

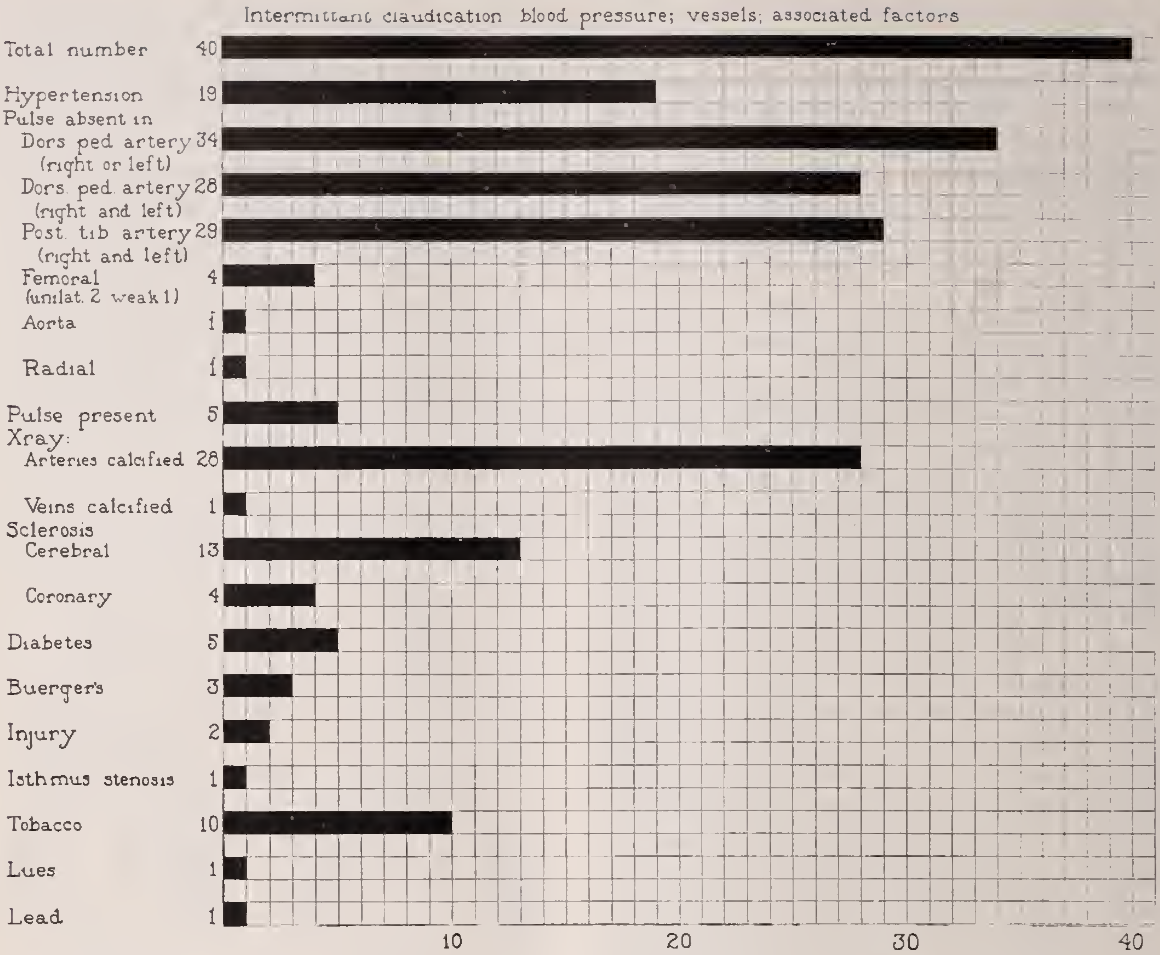

Fig. 2. Objective findings and associated conditions in forty cases of intermittent claudication.

the pigmentation and the syringomyelic paws instantly arouse suspicion.

Patients convalescing from a serious illness not infrequently develop ulnar neuritis from pressure of the forearms on the arms of a chair, or palsy of the external popliteal nerve with foot drop, from pressure on the edge of a chair or from crossing their knees. A very interesting type of neuritis is a slowly progressive palsy of the ulnar nerve, which may occur years after a fracture of the elbow. It is caused by the overriding of this nerve in a shallow groove. Palpation of the nerve at the elbow reveals it to be hard and greatly thickened. If not too advanced, the situation may be remedied by transplanting the nerve anterior to the internal condyle.

INTERMITTENT LIMPING

Intermittent limping was known first to the veterinarians, who observed it in horses, in which it was caused by an endarteritis of the aorta, due to the larva of *Strongylus vulgaris*. It was described in man as intermittent claudication, in 1858, by Charcot. A cramping pain which usually appears in the legs after walking a short distance, compelling the patient to rest awhile, and reappearing on exercise, constitutes the syndrome. An obliterative process of the arterial vessels resulting in a relative asphyxia, usually furnishes the cause. The main characteristics are given in figures 2 and 3.

A unique case is that of a woman who had this syndrome for one year and four months. Pulsation was absent in the arteries of the feet, the femoral arteries and the abdominal aorta. When a sphygmomanometer was placed around the legs, the needle showed a fluctuation of only one-half point. Whenever the patient exerted herself too much, evidences of cardiac embarrassment appeared. The cause was probably congenital stenosis of the isthmus of the aorta.

I could find the report of only one similar case, that of a horse described by Fröhner, a veterinarian. The animal was eight years old, and had had the disorder since birth. The report contained a model of physical examination, including such points as

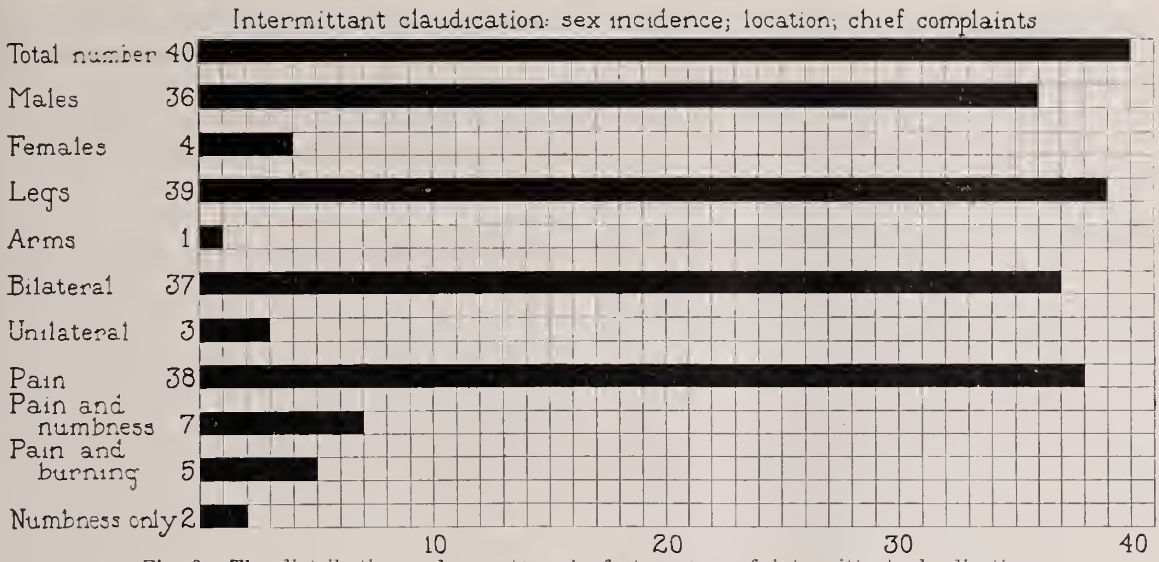

Fig. 3. The distribution and symptoms in forty cases of intermittent claudication.

the excursion of the lung borders and the mental status, and would have satisfied the most punctilious internist, although he might have been disappointed by the absence of the analysis of the blood. The necropsy disclosed a coarctation of the aorta at the isthmus.

It is always well to palpate the superficial arteries, since a thrombosis or an embolus may at times produce an ischemic neuritis with intense pain, anesthesia and paralysis.

PSYCHOGENIC PAINS

We often fail to acquaint ourselves with the emotional life of our patients, which has no limitations. Like the philosopher's description of the universe, it resembles a huge sphere whose center is everywhere, and whose surface is nowhere. That we must be on the alert constantly is illustrated by the case of a woman who complained of pain in her side, for which her appendix was removed. Pain in both hands and in both feet, which she insisted on talking about, was disregarded. She later proclaimed with ecstacy that she was Christ crucified.

The diagnosis of hysterical and certain psychiatric disturbances, particularly when they present themselves in the guise of physical incapacity, is seldom so transparent. We must not overlook the fact that many cases of organic disease exhibit an hysterical embellishment. We must not forget that psychoneurotic disturbances may incapacitate a patient as completely as any organic disease, which often yields better to treatment than the former. An episode highly charged with emotions, often hidden or forgotten, or the failure to adjust desires to environment, furnishes the basis of these disturbances. The fears, self indulgences and complexes of our patients should be replaced by a satisfactory adaptation and a robust philosophy.

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Gallstones in Children. J. D. Carey, Fort Collins, Colo. (*Journal A. M. A.*, April 17, 1926), relates the case of a girl, aged 9 years and 3 months, who was referred for operation for appendicitis. Two years previously, she began to have attacks of abdominal pain located in right side; some vomiting, slight fever and a small degree of rigidity. Attacks would come on suddenly and confine her to bed for a period lasting from two to four days. There was no jaundice or clay colored stools; the bowels were regular, and no digestive disturbance occurred between attacks. A slightly inflamed appendix was removed.. Pelvis normal; gallbladder greatly distended, and an oval stone 1 inch in diameter, was lodged in common duct. Gallbladder removed and wound closed. The recovery was uninterrupted.

SPINAL ANESTHESIA IN ABDOMINAL SURGERY*

Carl H. Bastron, M.D.
PORTLAND, ORE.

There are drawbacks, more or less, to all forms of anesthesia. It is the number and degree to which these are present that determines whether any given form or method of anesthesia will become generally useful, or will be discarded after preliminary trial. Chloroform has been generally discarded as a surgical anesthetic in favor of ether, because of its greater toxicity, although it is a far more efficient anesthetic than ether. Ether, in its turn, is no longer considered the fool-proof anesthetic it was a few years ago. As to the newer inhalation anesthetics, notably nitrous oxide-oxygen and ethylene, there is not much hope that any of them will be universally accepted as the anesthetic of choice.

That inhalation anesthesia is still much of a problem, at least to a considerable proportion of surgeons the world over, is evident from the great development in recent years of various forms of so-called local anesthesia. At present the general usefulness of most of these is restricted by difficulties in technic or by being applicable in but a small number of surgical procedures; but there is no reason why, with the safe and efficient drugs at our command, and with the development of safer and simpler methods of application, one or another of these methods may not become the anesthetic of choice in any given surgical procedure. The limitations to inhalation anesthetics are generally their toxic effects on the patient, and are inherent in the drug itself rather than in the method of administration, while in the case of local anesthetics the objectionable features, as a rule, are their complicated methods of application rather than their toxicity.

Of the so-called local or regional anesthetics, spinal anesthesia is perhaps the most widely applicable in major surgery. The dangers of this type of anesthesia that we still hear so much about are dangers of the past, and occurred when cocain and other highly toxic drugs were used. Deaths after spinal anesthesia were not due to the method of application any more than those occurring after the topical application of cocain were due to the method of applying it; such deaths were due to the cocain itself. After the introduction of novocain and other nontoxic drugs, fatalities after spinal anesthesia have become rare occurrences, and with the improvement in technic fewer immediate and remote ill effects are noted. It is not stretching the truth when I say that, with a faultless technic and a careful selection of cases, fatalities and bad effects after spinal anesthesia should be fewer than after either anesthesia.

Spinal anesthesia is administered with the patient lying on his side, usually the right, the thighs being flexed on the abdomen and the head inclined toward the knees. The top of the table is horizontal, but the patient's head is propped up on pillows. After iodization the skin and deeper tissues are anesthetized, and a small-caliber needle, with stylet removed, is carefully introduced into the spinal canal. As soon as the spinal fluid flows freely, about two or three c.c. are collected into the ampoule containing the novocain crystals, and the latter dissolved by gently tapping the ampoule as the fluid drops into it. The novocain-spinal fluid is drawn up into a small syringe, and slowly injected into the spinal canal, aspirating spinal fluid several times during the process of injection. This is done to ascertain whether the needle is still in the spinal sac, as well as to insure thorough mixing of the novocain with the spinal fluid. Anesthesia is complete in four to seven minutes; therefore one is ready to operate as soon as the operative field is prepared.

Injections into the spinal canal are made high or low, depending on whether it is desired to operate above or below the umbilicus. Low injections are made below the second lumbar vertebra, high injections above the first lumbar, but seldom higher than the eleventh thoracic vertebra.

Absence of anesthesia and partial anesthesia are referred to as failures with spinal anesthesia. I am convinced that these failures are practically always due to faulty technic, and are therefore avoidable. They are avoided by making sure that during the entire time of injection the needle is in the spinal sac, by occasionally aspirating fluid. If no fluid can be aspirated, the needle is not in the sac, and injection of the anesthetic will be made extradurally. If a large caliber needle is used, a considerable amount of the anesthetic solution may leak out through the hole in the dura after the withdrawal of the needle, and result in partial anesthesia.

Spinal anesthesia lasts from one to two hours. Sometimes an otherwise perfect anesthesia lasts only a very short time; this is usually due to too small a dose. The employment of a large-caliber needle may lead to the same result. The average dose in adults is about 150 mg. novocain in crystal form, without adrenalin.

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* Read before Portland City and County Medical Society, Portland, Ore., March 3, 1926.

While it is essential for good results to make a careful selection of cases for spinal anesthesia, in general it is safe to follow the rules applying to general anesthesia. Many patients may be safely operated on under spinal anesthesia who would be considered bad risks for general anesthesia, notably patients with pulmonary tuberculosis and diseases of the heart.

It is possible with spinal anesthesia to anesthetize the entire body from the neck down, but anesthesias higher than the nipple have seldom been attempted. As the anesthetic diffuses for a variable distance above the point of injection, one must be very careful in high injections to prevent paralysis of respiration.

Any patient old enough to cooperate with the surgeon is old enough to be operated on under spinal anesthesia. The lowest age limit, therefore, lies between ten and fifteen years; beyond this there is no age limit. Highly nervous, prejudiced persons are poor subjects for this form of anesthesia; they cannot be reasoned with, complain of the least pain, and imagine they are being hurt when in reality they are not. Infectious processes in the neighborhood of the spine, degenerative diseases of the central nervous system, such as tabes and paresis, and spina bifida are contraindications to spinal anesthesia. Patients with marked arteriosclerosis associated with hypertension, especially if in addition there is impairment of the kidneys, should not be subjected to spinal anesthesia, as they stand sudden changes in blood pressure very poorly.

I do not agree, as is commonly accepted, that hypotension is a contraindication to spinal anesthesia. The basis for this belief is the marked drop in blood pressure, accompanied by more or less marked signs of collapse, occurring the first ten to fifteen minutes following spinal anesthesia. I believe that these ill effects are not due to the low level to which the blood pressure drops, but to the suddenness with which this drop takes place. They are regularly noted after high injections, seldom after low ones, and occur with high blood pressures as regularly as they do with low pressures.

The depression of the blood pressures is the greatest danger of spinal anesthesia. It occurs during the first few minutes after injection, and may drop in a surprisingly short time 40 to 80 or even 100 mm. mercury, the systolic pressure in some cases reaching 60 to 50 mm. The pulse at the same time becomes slower and more easily compressible, and respiration decreases in volume and frequency. The patient usually shows symptoms of shock of various degree, from slight pallor with perspiring forehead, to extreme pallor with clammy skin, cold extremities and unconsciousness.

Adrenalin is usually given intramuscularly at this stage, but whether due to the stimulating effect of the adrenalin or to the natural adjustment of the system to the rapidly occurring changes, improvement soon is noted in the pulse and respiration, and the patient's color is less pale; the danger point of spinal anesthesia is passed. But with this improvement there is no corresponding rise in the blood pressure. In fact, the latter may go on dropping after the patient's recovery from shock is well under way. It is this feature that leads me to believe that the untoward symptoms accompanying the drop in blood pressure are not due to the blood pressure being low, but to the suddenness with which this lowering takes place.

Preoperative stimulation in my experience has been of very little help in preventing the depression of the blood pressure and its effects on the patient. Preoperative hypodermics of pituitrin are regularly given just before the anesthetic is administered, and adrenalin is given as soon as the blood pressure drops to 80 systolic, while ether inhalation is started as soon as the patient is turned on his back and continued during the first ten minutes. None of these measures seems to prevent a drop in the blood pressure appreciably, but adrenalin seems to have a reviving effect on the patient in cases of collapse. I have not found the blood pressure reliable as a guide for stimulation; the pulse is more dependable.

The most plausible theory accounting for these marked changes in the blood pressure is the one according to which anesthesia or paralysis of the splanchnic nerves takes place, causing abolition of the tone of the abdominal vessels, with consequent dilatation and a sudden rushing into the abdominal area of a large proportion of the blood. This sudden change takes the load from the heart under which it is accustomed to work, causing a temporary embarrassment of that organ, manifested as shock. After the heart has accustomed itself to this change in pressure, all untoward symptoms disappear, even though the pressure does not rise immediately.

CONCLUSIONS

1. With nontoxic drugs and a faultless technic spinal anesthesia is practically devoid of dangers.

2. Spinal anesthesia is a practical procedure in all operations below the diaphragm.

3. Failures in spinal anesthesia are almost always due to faulty technic.

4. Spinal anesthesia is not contraindicated in pulmonary tuberculosis, heart disease and low blood pressure.

5. Preoperative stimulation is of little value in prevention of blood pressure drop.

6. The symptoms of collapse after spinal anesthesia are not due to the lowered blood pressure, but to the suddenness of this lowering.

831 Union Avenue North.

THE RELATION BETWEEN AUDITION AND THE CIRCULATION OF THE BLOOD IN THE HEAD*

Hamilton Stillson, M.D.
SEATTLE, WASH.

We may safely refer you to the text-books for the anatomy of the circulation of the blood in the head, remarking only that certain peculiarities obtain. There is perhaps unusual anastomosis in the vessels, the circulation in parts dispensing with capillaries, permitting the flow directly from arteries to veins. Within the cavum the walls of the blood vessels are extremely thin in comparison with the size of the vessels. Unlike the other parts of the body, the volume of blood within the cavum remains practically constant, increase or decrease of functional activities being taken care of by increase or decrease in the rate of flow of the blood through the vessels.

This circulation within the cavum has also the unique distinction of being influenced by the presence of a greater or less amount of cerebrospinal fluid. Here in the closed cavum, the forces of gravity, barometric pressure, etc. influence the circulation more notably than in other parts of the body. And, since the auditory labyrinth is the only organ of the body situated within a bony cavity, the pressure of its contents must remain fairly constant. And since the fluids in the labyrinth are in relation to the cerebrospinal fluid, the fluctuation in its volume within the cavum will be manifest in the labyrinth.

It must be remarked, also, that the auditory apparatus is really a combination of two, possibly three organs; that the circulation to the external parts is very greatly different from that to the internal parts; that while, for instance, the circulation within the cavum is influenced but little by vasomotor reflexes, the circulation within the labyrinth is influenced somewhat. And the circulation within the walls of the tympanum and in the external ear are greatly influenced by sympathetic nerve reactions.

We must not forget also that the circulation in the inner ear is a terminal circulation. The character of vessels and the functional activities of terminal nerves differ greatly in different periods of life; and hence congestion of the circulation in the head will seem to have a greater effect upon audition than upon any other special senses. This is made more noticeable by the fact that the ears have the greatest number of different and apparently unassociated functions—sound, equilibration, muscle-tonus, etc., whose disturbance give nausea, nystagmus, etc.

And, lastly, we must remark in this introduction that in no other part of the body is seen so clearly the workings of compensatory coordination of functions as is seen in the relation between the cerebral circulation and that of other parts of the body, particularly the splanchnic circulation. This introduction outlines more material than the limits of this paper will permit us to consider, but I ask your attention for a few minutes to two or three of these subjects.

CONGESTION

The labyrinth receives its vasomotor supply from a different source (the vertebral artery) from that furnished to the conductive portion of the ear. One would expect the carotid to supply the labyrinth. In its path through the bone the carotid lies close to it. Yet neither the internal nor the external carotid furnishes blood to the labyrinth. It is the vertebral artery that furnishes it, a circumstance which Woakes calls "most suggestive." To quote him:

"In the first place, this position of the vertebral artery brings it, near its origin, into close proximity with the inferior cervical ganglion, from which it derives a rich plexus of nerves, the vertebral plexus, communicating in its upward course with the several cords which form the brachial plexus. It is important to note also that the inferior ganglion furnishes one of the regulatory nerves of the heart, viz., the inferior cardiac nerve. This nerve exerts important effects upon the heart's action, rendering individual contractions feeble and less effective. * * * The purpose of associating the inferior cardiac nerve with the vertebral plexus is readily seen for, since altered tension in the labyrinth and semicircular canals brings about weakness and giddiness, it is necessary that the heart be regulated and inhibited, lest the aural disturbance become unendurable."

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* Read before Puget Sound Academy of Ophthalmology and Oto-Laryngology, Seattle, Wash., March 16, 1926.

The complement between the cerebral and splachnic circulation is too well known to need elaboration. We need only remark that, though this complement is important for the maintenance of auditory function in all animals, it is more necessary in man, since in him the ratio of blood supply to the head is vastly greater than in the lower animals; and, from the disturbances due to civilization, man suffers vastly greater disturbances of this complement than do the lower animals; and he suffers in consequence greater deterioration of audition from age than do the lower animals.

DISTURBANCES OF "STATICS"

For practical reasons, then, it is necessary to consider some of the conditions affecting the blood supply to the centers of hearing in the brain and labyrinth through the vertebral artery and to the conductive apparatus through the carotids. In the normal ear we may say, as a general proposition, increasing the blood supply increases the hearing within physiologic limits. Decreasing the blood supply decreases the hearing, within physiologic limits. The factors causing variations in the blood supply are many, none being greater than variations in what we may call "statics" influences.

Statics affect both the internal and the external ear blood circulation, though in an apparently different way. For, in the tube and tympanum, the disturbance of statics causes, first, a congestion which may or may not be followed by inflammation. While in the labyrinth and in the cerebrum the disturbance of statics causes readjustment of the ratio between blood and serum volume which may or may not be followed by an increase or decrease in the rate of flow of blood through the vessels.

To elaborate upon the disturbances in the external auditory mechanism, we need only consider the so-called catarrhal deafness. This is essentially a hyperemia, usually a passive hyperemia of the mucosa of the nose, nasopharynx, tube and tympanum, especially the anterior superior part of the tympanum. In this latter situation are found the greatest vascular anastomoses (seen best along the handle of the malleus in hyperemia). And in the newborn infant the mucosæ are usually very thick and vascular, and the anterior portion of the tympanic cavity is filled with jelly-like serum. It is quite to be expected, therefore, that in catarrhal deafness there should be serous exudation in the tympanum, especially from the superior anterior portion. But what is usually overlooked is the fact that disturbance of statics is the original cause and that anything less than restoration of statics equilibrium will fail to restore the hearing. This is why Welty insists that catheterization alone of the eustachian tube in catarrhal deafness is futile.

Since this is such a practical matter, we may be pardoned for dwelling on it for a moment. At its inception catarrhal congestion results from disturbance of statics equilibrium. A small current of cold air impinging upon one part of the body reacts through the sympathetic nerves, causing blanching in that part and congestion in the deeper roots. Circulatory equilibrium is thus disturbed, the mucous membranes swell with their retained blood, exudates and infiltrates form. The so-called "resistance" is lowered, germs and their toxins are able to make their invasion, and hydrostatics, aerostatics, gravitational and capillary, and osmotic forces work haphazard and at cross purposes.

This disturbance of circulatory equilibrium is seen more noticeably in the head, and since here the vascularization and anastomosis are relatively so much greater than in other parts of the body, we say of the patient, "he has a cold in the head." It goes without saying that the aerostatics of the ear will be disturbed, if the tube to the ear be closed by the swelling. But simply blowing open the tube with the catheter or with the Politzer bag without reducing the swelling will certainly be futile.

A good deal of misconception obtains relative to the natural mechanism of aeration through the tube. It is, of course, presumptuous in me to assert that even Politzer and Gruber are in error in their conception of how manipulation of the tube produces so-called aeration of the tympanum. But while we cannot here go into detail, if you will permit me to digress a moment, I will state my ideas concerning it.

Aerostatic equilibrium must be maintained in the air pressure on both sides of the membrana-tympanum. Air pressure is admitted to its inner side through the eustachian tube. But the tube is normally closed below the isthmus. And the oxygen in the air retained in the tympanum is soon absorbed, lessening the volume and causing negative pressure. To restore equilibrium a bubble of air is forced up the tube every time we swallow. The tensor palati, by pulling on the hook of the tubal cartilage, pulls the membranous wall of the tube apart from its contact with the cartilagenous wall, beginning at the upper portion of the contact. Just before the tensor palati succeeds in opening the tube, the levator palati, by bunching up its belly, and, assisted by the constrictors and other muscles, plugs the open pharyngeal end of the tube, forces a bubble of air up the tube and relieves the negative pressure mentioned. If you will observe carefully, you will notice that there are two distinct clicks in the tube accompanying the act of swallowing, especially if there be any congestion in the walls of the tube. The first click, I take it, is the action of the tensor palati; the second is the click accompanying the passage of the bubble of air.

To demonstrate the action of the tensor palati in the production of the first click, place a manometer in the external auditory meatus after the manner of Politzer, and swallow slowly but fully. At the time of the first click, the manometric index will be drawn inwards slightly, indicating slight initial negative pressure in the tympanum and auditory meatus. This initial negative pressure is entirely ignored by Gruber and Politzer in their efforts to show how the tympanum is aerated in the act of deglutition. For, from pathologic data alone they both insist that the act of swallowing makes the eustachian tube open till it "gapes." We must be pardoned for saying it does nothing of the kind. To be sure, the manometric index jumps outward at close of deglutition, and this surely indicates that air has rushed up the tube to restore aeration. But why, at the beginning of the act of swallowing, should the membrana-tympanum be drawn inward? In my judgment, it is because the tensor palati, by pulling the adherent walls of the tube apart, beginning at the upper portion and extending its action down the adherent part of the tube walls, does not succeed in getting the tube open before the tension of the air in the tympanum is lowered, thus drawing the membrana-tympanum and the manometric index inward.

But this is followed by the outward movement of the index. The tension of the air in the tympanum is now increased. How? By the gaping of the tube? Not all all. At this stage of deglutition, all the muscles around the pharyngeal end of the tube are pressing against and closing it. And the action of the levator palati and associate muscles in forcing the bubble of air up into the tube can be demonstrated by thrusting the tip of the tongue up into the nasopharynx and feeling the behavior of the muscles and tube. I have elsewhere mentioned the technic. With the tongue feeling the tube, attempt to swallow. The muscles will be felt squeezing the pharyngeal end of the tube deeper into the fossa of Rosenmueller, and the belly of the levator palati can be felt bunching up against the membranous portion, pushing the bubble of air up into the tube. In my opinion, it is this bubble that aerates the tube.

I have dwelt thus upon the aeration of the tympanum not only to show how the aerostatic equilibrium is restored in it, but to show how circulatory hyperemia in the tympanum is relieved by it. It is readily seen that, with negative pressure in the air in the tympanum, there will be congestion, swelling and serum seepage, which will not be relieved until the negative pressure is relieved.

THE INTERNAL AUDITORY CIRCULATION

I have mentioned some peculiarities of the circulation within the cavum and labyrinth. I shall have to refer you to Shambaugh (*Archives Otology*, XXXIII and XXXIV) for recent advances in our knowledge of the anatomy of the circulation of blood in the labyrinth.

We can elaborate but mildly, in the few minutes remaining at our disposal, upon some of the factors affecting audition in disturbances of circulation within the cavum.

INCREASE OR DECREASE IN VOLUME

Inasmuch as the whole floor and the lateral wall of the fourth ventricle can be regarded as the primary terminal station of the vestibular nerve (Panse), any increase or decrease in the pressure of the cerebrospinal fluid within the ventricle will disturb hearing. Pressed for time, I shall have to refer you to Schoenberg (*J. A. M. A.*, June 24, 1916) for the origin and flow of the cerebrospinal fluid and the ways in which this equilibrium of pressure is maintained.

Swift, in an article entitled "Cerebroventricular Study" (*N. W. Med.*, Oct., 1925), has summed up in a masterly way the literature to date, remarking that cerebrospinal pressure under definite postural conditions varies but little under ordinary circumstances. But the slightest degree of constriction of the large veins of the neck leads to an immediate and marked rise in pressure of the fluid. The point we wish here to emphasize is that varying conditions will vary the pressure of the cerebrospinal fluid within the ventricle.

The condition of the heart and blood-vessels, of course, has much to do in maintaining normal equilibrium within the cavum and labyrinth. Here the relation of blood pressure to vasomotor tone, influences of postural change, etc., should be mentioned, but I must refer you to Mortensen's studies (*The Bulletin of Battle Creek Sanitarium,* Vol. XIX, p. 264) for a clear presentation.

Arteriosclerosis, splanchnic reflexes, emotional stresses, toxic poisoning, etc., in their disturbances of the cerebral circulation can only be mentioned in passing.

A word in conclusion. It must be evident from these observations that disturbances of audition formerly held to be from purely local causes may really be from disturbances of the general circulatory system.

Tinnitus and deafness, especially if accompanied by gradual loss of bone conduction, may be due entirely to beginning arteriosclerosis. In anemia, if progressive and prolonged, there will usually be progressive and permanent deafness, due doubtless to obliteration of some of the blood vessels of the cochlea or of the special centers of the brain. I believe with Bishop that weak circulation, with low arterial pressure, is often a matter of vasomotor deficiency rather than heart weakness, though of course there may be a weak heart further weakened by failure of compensatory constriction of the peripheral vessels. These cases will give tinnitus, deafness and dizziness. A deafness without dizziness, tinnitus or Meriere syndromes, with some general symptoms of arteriosclerosis, will probably be caused by thickening of the vessels supplying the nucleus; and, if there is any peripheral paralysis in the case, it will indicate disease of the internal capsule, circulatory disturbances in the arteries of the semicircular canals, or the special centers of equilibration and may give rise to a tinnitus or a dizziness that may not be accompanied by deafness. And so on and so on.

It is a fruitful field and one that we may cultivate with profit. I believe that, if we study circulatory disturbances of the ear, we will not only broaden our outlook, but will devise something better to do for some of our deaf patients than politzerization.

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CEREBROSPINAL MENINGITIS

C. H. Hofrichter, M.D.
AND
John W. Unis, M.D.
SEATTLE, WASH.

During the winter months of the present year a number of cases of cerebrospinal meningitis have presented themselves for care at Seattle City Hospital. The reluctance of the private hospital to house cases of this disease has made the opportunities for observation of such cases particularly abundant in the city hospital ward. Fifteen cases have presented themselves for treatment since February 1, eleven of which were cared for on the medical service.

The number of cases have not been sufficient to present the aspects of an epidemic, but a sufficient number have appeared to demonstrate the endemic presence of the disease. It has been the history of epidemics of cerebrospinal meningitis in other localities that the disease has existed in an endemic manner for some time prior to the outbreak of its manifestations in epidemic form. With the prevalence of a disease in endemic form in a population of 400,000 people, some attention should be given to the characteristics and treatment of this entity.

It has occurred to the authors that a review of some of the experiences of the past few months might be of interest and benefit to the members of the hospital staff and our colleagues in this district.

Etiology. The cases presented for treatment were found in the following places: One newsboy, private house, one apartment house owner, eight cheap lodging house occupants, one hospital physician.

Nine of our series of eleven cases were found in places where people were closely grouped together for convenience, or as a matter of necessity. Two cases came from one lodging house and three from another. No information was obtained in regard to the incubation period.

Sex. All of our series were males.

Age. The age incidence varied as follows: Thirty, sixty-three, thirteen, thirty-five, thirty-five, fifty-five, twenty-one, nineteen, twenty-five, twenty-five, thirty-six. Four additional cases under twelve years of age were cared for by the pediatric service. Only one of these was a female

Bacteriology. The organism in cerebrospinal meningitis of epidemic nature is a diplococcus intracellularis, gram-negative. The virulence of this organism during the presence of this group of cases was manifested at times in a very severe manner. For example:

Case 1. Apparently well at 5:00 p.m. Had a temperature of 104.4° at 6:30 a.m. the following morning. At 8:00 a.m. of this same day the hemorrhagic eruption was present. At 10:00 a.m. the meningococcus was found in the cerebrospinal fluid. This case resulted in recovery.

Case 2. At 4:00 p.m. patient on street apparently well. At 5:00 p.m. visited with friends. At 10:30 p.m. was found unconscious in his room by hospital physician. Died in fifty hours from onset.

Case 3. At 4:00 p.m. complained of chills and nervousness. At 8:00 a.m. following morning had temperature of 101°, with total inability to respond and with marked purpuric eruption. Died five and one-half days after onset.

This demonstrates what we wish to emphasize in regard to the necessity of early diagnosis and treatment.

Symptomatology. The physician, within whose power lies the greatest possibility of benefiting the case of cerebrospinal meningitis, is the one who first comes in contact with the afflicted individual and makes the diagnosis. Too much stress cannot be laid upon the advantage of early diagnosis, for the sooner the antimeningococcic serum is administered the greater the benefit.

The accepted progression of the meningococcus infection seems to be through three definite stages. The first stage is not distinguishable from the common influenza. During this period meningococci gain admission to the blood stream and there is a resultant generalized blood stream infection. The clinical manifestations of this stage of development are those accompanying any severe acute infection, namely, sharp rise in temperature, rapid pulse, capillary dilatation, generalized muscle aching, nausea, vomiting, backache, headache, and chills and fever. During the epidemic prevalence of the disease trained observers have made their clinical diagnosis at this time; and when the bacteria have been prevalent in the blood stream have given the antimeningococcic serum intravenously which has terminated the progression of the symptoms. The toxemia prevalent at this time will occasionally cause the appearance of purpuric spots in large numbers just beneath the epidermis. This phenomenon has given rise to the name of "spotted fever." Two observations of this phenomenon have been available. It is at this stage that the intravenous therapy seems most efficacious. In two instances extensive herpes facialis was observed.

The third stage is characterized with clinical evidence of irritation of the central nervous system. The muscles of the neck are contracted and prevent the flexion of the head (orthotonus.) The hamstring muscles are taut and prevent the elevation of the thigh to a right angle with the abdomen, when the leg is extended (Kernig sign). It is with this clinical symptomatology that a lumbar puncture usually seems justifiable, and the performance of which results in a cloudy fluid under pressure.

Permit us at this point to urge the performance of lumbar puncture during the second stage of development for the purpose of early diagnosis and treatment.

Cerebrospinal Fluid. All cases presented fluid under pressure with marked turbidity. The cell count varied from almost pure pus to a moderate increase. The intracellular gram negative diplococcus was found in all instances but one. In this instance there were definite clinical symptoms, a cerebrospinal fluid cell count of 130, and definite response to serum and drainage therapy.

Temperature. The typical favorable temperature response is presented in the accompanying graphic record (fig. 1).

The typical unfavorable temperature response is presented in the accompanying graphic record (fig. 2).

Serum Treatment. The therapy followed has been based upon the suggestions of the literature of the administration of antimeningococcic serum as early as possible, and the continuation of its administration until clinical manifestations of the disease had subsided. Some experience has been gained from the application of this treatment in this manner in former years.

When the patient was first seen, a clinical diagnosis was made and a lumbar puncture done immediately. If the fluid showed signs of increased pressure or turbidity, from 15 to 30 cubic centimeters of antimeningococcic polyvalent serum was injected, if an equal or greater amount of cerebrospinal fluid had been withdrawn. The fluid was then sent to the laboratory for cell count and bacteriologic examination. Spinal puncture was again repeated in six hours, and antimeningococcic serum was administered according to the amount of cerebrospinal fluid withdrawn. The fluid was withdrawn slowly until the pressure was diminished, and then antimeningococcic serum was given. Our custom was to administer slowly a few cubic centimeters less serum than we were able to obtain of cerebrospinal fluid.

This practice was continued every six hours until definite manifestations of improvement were seen

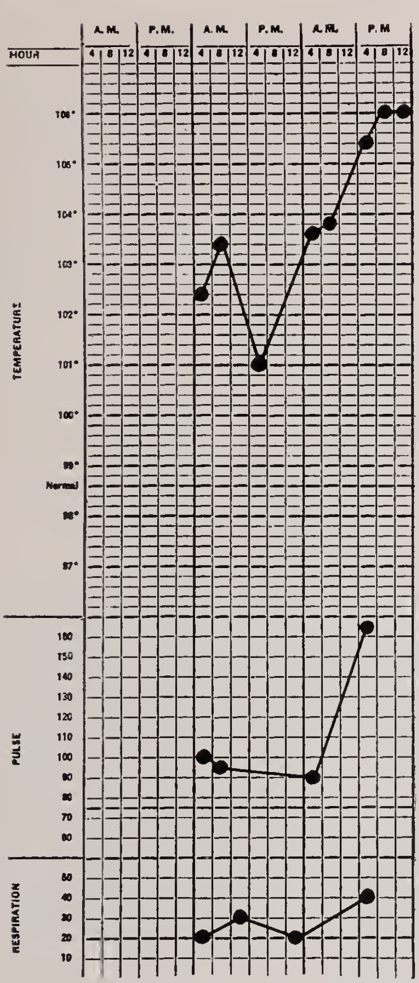

Fig. 2.

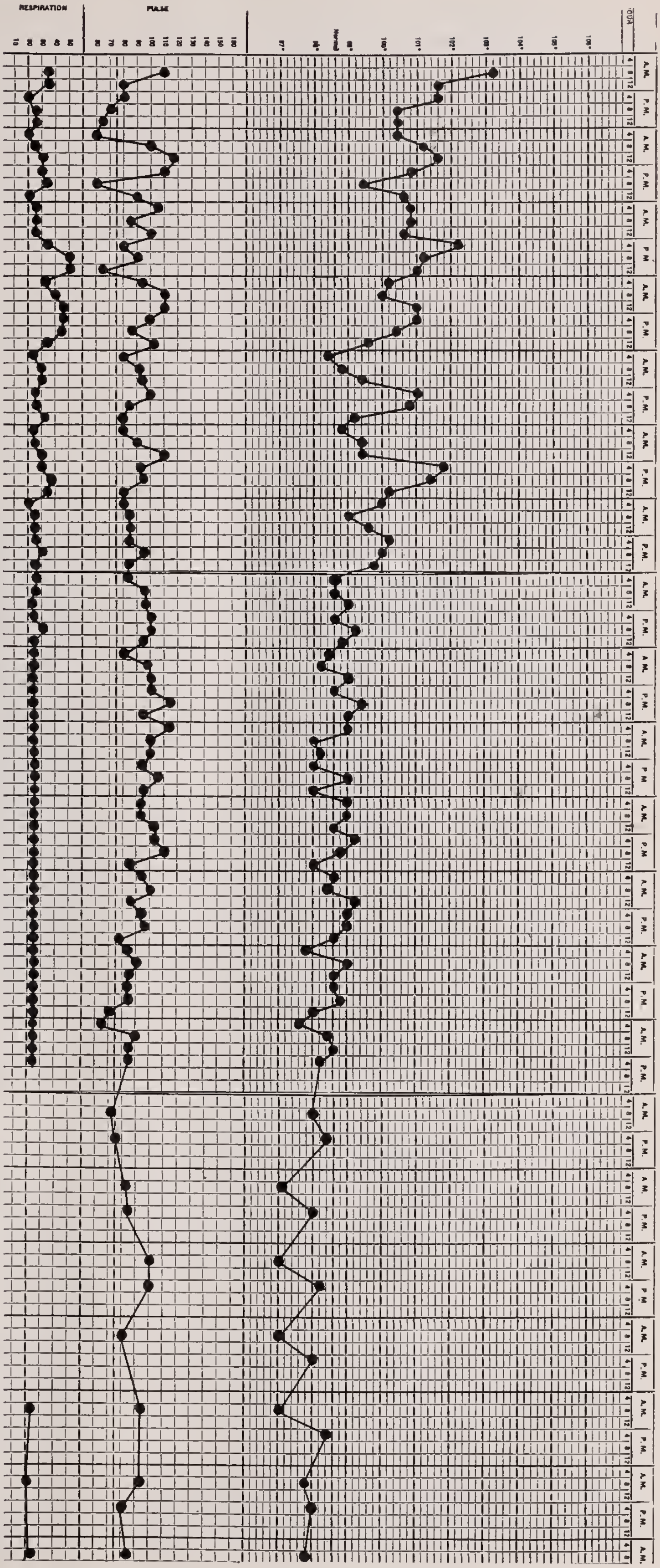

Fig. 1.

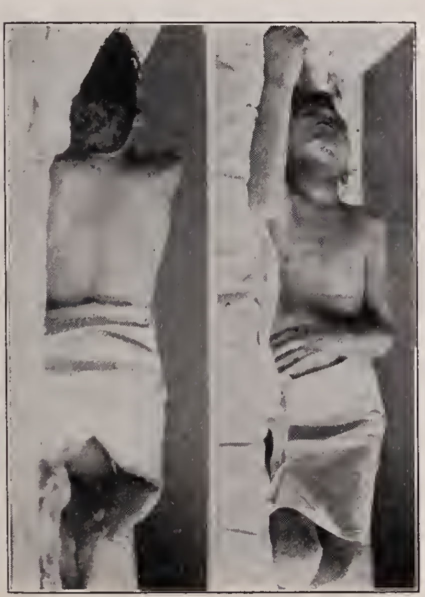

Fig. 3. Shows retraction of head and flexion of knees in case represented by fig. 1.

by a diminution of the clinical symptoms of nerve irritation, a drop in temperature or a combination of both. As soon as this stage was reached the serum was given every twelve hours for several doses, until again improvement was seen in the clinical manifestations, at which time the administration of the serum was changed to every twenty-four hours. This routine was carried out until there was still further improvement in the clinical manifestations, at which time the serum was discontinued. Spinal drainage was continued.

The characteristics of the cerebrospinal fluid as to quantity and cell count were observed to determine when the infection was subsiding or progressing, as manifested by the number of leukocytes present. It seems difficult to know when to stop treatment, and probably more harm has been done by stopping it too early because of the unpleasantness of it than by continuing it too long. If after the cessation of the serum administration there was a rise in temperature, or an increase in the cell count of the cerebrospinal fluid, the administration of the antimeningococcic serum was again instituted. No unpleasant effects other than a slight rise in temperature were experienced in one case, when the serum was given the second time after three days of cessation of its administration.

The most prolonged application of the combined serum and drainage treatment did not extend over eight days, although the period of hospitalization and observation extended over approximately a two week interval. Serum reactions were seen in five instances and were of two types. Two cases showed symptoms of shock during the administration of the serum, and three cases showed an urticarial eruption several days following serum injection.

Intravenous injection of serum was used in one instance during the secondary stage of the disease. This method of treatment is most efficacious at this time, but it demands very early diagnosis. Three cases received subcutaneous injections without reaction, but the one case receiving intravenous injection presented immediate symptoms of serum reaction.

Drug Treatment. Anodynes were used according to indication with some beneficial results, and, where extreme discomfort and pain were present, small doses of morphine were used.

Nutrition. An effort was made to keep up the nutrition of the patients by the administration of readily absorbable carbohydrate foods in liquid form. This method of feeding aided us greatly in the elimination of the acidosis which was practically a constant finding in our series.

Mortality. There were four deaths in the group of eleven cases handled by the medical service. The total mortality of the fifteen cases was six, or 40 per cent. The usual mortality rate with the antimeningococcic serum is about 25 per cent. Two of the deaths in this series were in the hospital less than four hours time, and four had a good application of the serum treatment.

Summary of Results of Treatment. Four deaths.

1. Death fifty-three hours after first therapy.
2. Death eighty-four hours after first therapy.
3. Death five hours after first therapy.
4. Death ninety-one hours after first therapy.

Six left hospital with no apparent sequelæ. One left hospital improved and with some sequelæ.

Of this series three of the deaths were given what was considered adequate therapy and did not respond to treatment. One case was moribund upon admission to the hospital. Six cases made a satisfactory response to treatment.

Conclusions. It is our conclusion from the experiences gained in handling the above cases in the manner outlined, that the best opportunities for recovery lie, first, in early diagnosis and administration of the antimeningococcic serum; second, vigorous treatment during the acute manifestations of the disease; and, third, continuation of the treatment in a modified form for a short period after the clinical manifestations have subsided.

Patient whose temperature record is shown in figure 1. Demonstrates retraction of head and flexion of knees. Complete recovery.

NEWER PROBLEMS IN NONSURGICAL RHINOLOGY*

Ralph A. Fenton, M.D.
PORTLAND, ORE.

The rhinologist is occasionally made aware that an undercurrent of opinion represents surgical treatment as the only end and achievement in his specialty. Perhaps there may have been one or other among us who, like one of Moliere's caricatures of a medical man of his day, "was blindly attached to the opinions of our elders, never wanting to understand or listen to the reasons or experiments of the pretended discoveries of our century, touching the circulation of the blood and other opinions of like tenor."†

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* Read before the Portland Academy of Medicine, Portland, Ore., Feb. 11, 1926.

† Moliere: Le Malade Imaginaire, Act. II, Sc. VI.

But such rhinologists are certainly not to be found in this Academy, and I am grateful for the privilege of restating a few of our ancient problems along lines which are medical rather than surgical. Questions of individual susceptibility and resistance to allergic and infective irritants, of differences in the face of like exposure to weather conditions, to bathing in the same pool, to identical causative agencies—such questions are beginning to find answers, not from the surgical clinician, but from the anatomist, the pathologist and the serologist.

It should be recalled that the sensory innervation of the upper and posterior part of the nose, into which the various accessory sinuses open, is closely connected with the sympathetic nervous system through the sphenopalatine (Meckel's) ganglion (fig. 1). It will be remembered also that this ganglion has direct connections with the eye, as well as with the ear and the occipitomastoid region. Small wonder, therefore, that pressure or toxic irritation in this region may produce one type of so-called migraine, or may cause otalgia, leading to the suspicion of mastoiditis, or may, through direct vagus connections, arouse violent asthmatic disturbances.

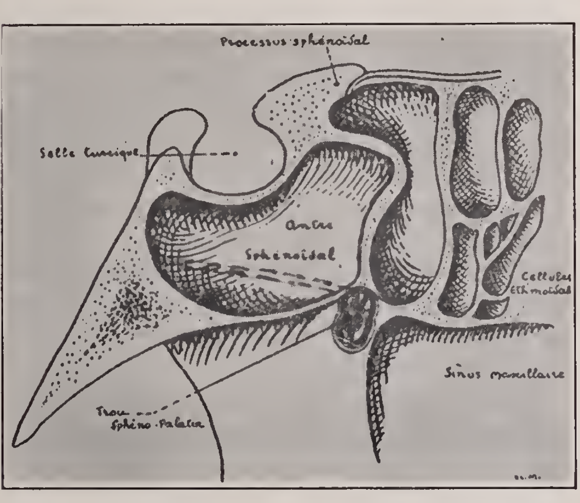

Fig. 1. (After Terracol.) The sphenopalatine ganglion in its relations to the maxillary antrum, posterior ethmoids and sphenoid sinus.

Another set of anatomic considerations relates to the optic nerves, which lie often in very close proximity to the mucoperiosteal lining of the sphenoidal sinus, with bone of extreme thinness between. Numerous cases have been observed, in which the optic nerve bulged into the lumen of the sphenoidal sinus, with actual dehiscences in the bony wall. Optic neuritis and more or less resultant atrophy have of late years been detected with considerable frequency in cases of this type, and startling relief to failing vision has attended early treatment.

Development of the human head from the lateral placement of eyes, with broad many chambered nose between, into our crowding of both orbits forward to secure binocular vision, has cramped the ethmoids and turbinates into a narrow chink, has twisted and compressed the neural and vascular tributaries to these structures, and has forced upon them the precarious existency of all rudimentary or vestigial structures.

The sympathetic system, through the sphenopalatine ganglion, controls the vascular channels which supply the nasal mucosa. Very slight disturbances in the region of the ganglion or its sensory connections may, therefore, readily modify the calibre of the nasal passages and the consistency and amount of the nasal secretions. Furthermore, with reduction of the nasal air chamber by acquired deformity, as with high septal thickenings opposite the middle turbinates, the slightest vascular changes may be sufficient to cause annoying pressure. Such pressure may be reflected in neuralgias at any of the various terminals of the sphenopalatine nerve-plexus, especially back along the Vidian nerve and out to the mucosal surfaces of the ear or to the skin over the mastoid and back of the neck.

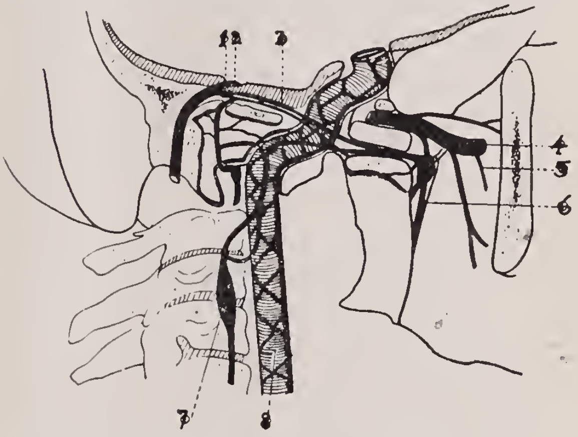

Fig. 2. (After Terracol.) Relations of the sphenopalatine ganglion to the facial and superior maxillary nerves and the carotia plexus. 1. Geniculate ganglion. 2. Facial nerve. 3. Great superficial petrosal nerve. 4. Second division of the trigeminal nerve. 5. Posterior dental nerves. 6. Sphenopalatine nerve. 7. Cervical sympathetic. 8. Carotid plexus.

The Vidian nerve is formed by the union of the great superficial petrosal from the geniculate ganglion of the facial, the great deep petrosal from the glossopharyngeal, and sympathetic connections from the carotid plexus (fig. 2). Numerous sympathetic fibers are said to occur in the great superficial petrosal also.

Anatomists disagree as to the exact structures of the sphenopalatine ganglion, but it seems to be conceded that a preponderance of sympathetic elements is there, intermingled with cerebrospinal fibers. Synapses with the sphenopalatine branch of the trigeminal exist, though this nerve passes in front of the body of the ganglion.

Both the Vidian and the optic nerve are left exposed to danger from the sphenoidal sinus, whose lack of present function leaves it little force to defend its own boundaries. Owing to the high and narrow sphenoidal ostium, little air interchange takes place. Very slight moisture and almost no redness of the mucosa may disclose to bacteriologic study practically pure cultures of highly virulent organisms. It has recently been suggested that filterable viruses from ultramicrosopic organisms may accumulate in these apparently empty spaces.

From this region, then, where the sympathetic-endocrine system has its uppermost connection short of the brain, impulses may spread to the respiratory mechanism, to the heart, to the digestive tract, to the genitourinary organs or vice versa. The rhinologist who claimed a panacea for menstrual headaches, or for asthmatoid attacks, would be foolish indeed, yet we should not forget that Bonnier of Paris won transient fame and fortune thirty years ago by cautery destruction of the posterior part of the middle turbinate, in just such cases. Migraines, cardiospasm, mucous colitis, a host of conditions that used to be dumped into the scrapbox of "hysteria", find not cures but clues in the distribution of the sphenopalatine ganglion. We look hopefully to the microscopic anatomists for continuing help in explaining the structure and function of these sympathetic connections, which seem to hold the key to many of the mysteries in the field of allergy and infection.

From this beginning, let us now consider very briefly some recent developments respecting protein susceptibilities, the so-called allergies. While hay-fever or "rose-cold" were first to be recognized, it is now definitely established that some fifteen per cent of the population are sensitized to various foreign proteins, mineral salts, or physical stimuli, and that such sensitiveness is an hereditary characteristic. When sensitized, individuals react excessively to very tiny quantities of the toxic agent, air-borne to considerable distances. Thus one of our patients, after the cessation of a severe ethmoiditis, became unable to enter his dairy barn or approach his herd of cows without sudden and violent nasal obstruction, tearing and asthmatic cough. It was ascertained that he reacted tremendously to a skin prick with 1:4,000,000 dilution of cow dander.

The various pollens—early summer grasses and late summer weeds—are well understood as sources of rhinologic irritation. Sagebrush (artemisia) is a frequent cause of trouble in the West. One patient had traveled to internists and laryngologists in Colorado, Wyoming, Montana, Idaho, Utah and Nevada, trying various changes in elevation without relief from asthma. No one had suggested an allergic basis, and it was not surprising to find that she reacted violently to all types of sagebrush pollen and is, therefore, perfectly comfortable west of the Cascades.

Vegetable products, especially cosmetics, face powder and eyelash paint; raw or cooked seeds, grains or nuts; oils extracted therefrom, for example, cocoanut oil used in frying or candymaking, or free in superfatted soap, and a great variety of vegetable foods are capable of sensitizing certain persons. Evidence of true bacterial allergies is rare, because contact is established with the bacterial toxin immediately upon the occurrence of infection, so that tolerance becomes gradually established. Alien serum, that of dissimilar human types or notably of the horse, is well known for its powerful anaphylactic effects, and calls for careful histories before administration of antitoxin, as well as the typed choice of human donors.

Relief of anaphylactic symptoms by adrenalin hypodermatically, through reenforcement of the flagging or inert sympathetic nervous system, is the exact converse of the local relief leading to general improvement which occurs when the region of the nose overlying the sphenopalatine ganglion is shrunk and somewhat anesthetized by cocain or antipyrin solution. Distant manifestations, such as hives or angioneurotic edema, do not yield so readily as do the nasal dripping and pale turbinal swelling, the conjunctivitis and the milder asthmatic attacks.

While it is true that the hay fever patient often has chronic nasal edema, a passive congestion with polyp formation, and it is also true that chronic infection of the accessory sinuses may supervene in such cases, it does not follow that surgical measures are often indicated. Rarely, when obstruction to one sinus or cell group is very severe, surgery may be required, but it should be kept down to the minimum, since operative treatment to relieve allergic conditions is generally recognized as bitterly disappointing.

Careful history taking, followed by dermal tests of suspected substances, will usually be found preferable to intraocular or intranasal use of suspected substances for diagnosis. Avoidance of the substance at fault, whether house dust, feathers or fur, pollens, food or what not, is of course the best treatment. The details of pollen and other protein therapy are accurately fixed, and they should be carefully settled for the individual case by an expert allergist. No type of immunization by injection demands more accurate oversight of dosage to avoid excessive reaction, and none can cause so much damage or disheartenment in a brief space through the careless or routine use of stock or stale products. Examination is expensive of time and of valuable material, but the diagnosis and cure of such cases is a matter of vast importance. Several careful students of allergic disease are working on Pacific Coast problems, notably at the University of Oregon Medical School.

Turning now from the allergic group of nasal disorders to the infective type, we are reminded of the tremendous infestation of our population by hemolytic types of organisms during the various epidemics of so-called "influenza," from 1918 on. This infestation is still taking its toll in every country of the world. It was highly interesting to those who were absent in military service for considerable periods to discover, on their return to private practice, an increase of 25 to 40 per cent of sinus infections over that observable in 1916 and 1917. One factor which has perhaps contributed to keep this total high is the increasing number of persons who indulge in swimming and diving, a hazard so important that it has for several years engaged the attention of a committee of the Section of Oto-laryngology of the American Medical Association.

Hemolysis, that property by which an organism destroys the oxygen-carrying function of the red blood corpuscles, is almost never observed in avirulent races of germs. The specificity of hemolysis for human blood has become an important criterion of pathogenicity in recent work. Older studies upon animal bloods are being repeated upon media containing human blood, with rather startling results.

One distinguished internist has discovered numerous cases of pure-culture infection of the nasopharynx by hemolytic organisms. These he deems responsible for preexistent chronic visceral disease, such as peptic ulcer, cholecystitis, appendicitis and nephritis. His rhinologic colleague obtains material from the nose by loop culture, contaminating an empty tube into which a few c.c. of the patient's own blood are then drawn. Active growth of a preponderant hemolytic species furnishes material for preparation of a vaccine which this author finds most helpful in the cure of the chronic visceral condition.

Painstaking and brilliant work under Wright in England has resulted in the discovery of certain hemolytic species which are definitely responsible for some types of asthma hitherto regarded as allergic. Vaccines prepared from these organisms have been highly successful in some of the most intractable cases. It is not improbable that we have here to do with bacterial types entering originally by the nasopharynx, but later developing a selective affinity for the intestinal mucosa. Isolation of such organisms is tedious and difficult, but has been vitally helpful to many chronic sufferers.

Following the analogy of mass-culture vaccination against the coli-typhoid group of bacteria, similar undifferentiated mass-culture from the nose has been advocated of late. The killed culture, containing an indefinite amount of mixed toxin, is packed into the nasal fossæ upon gauze or cotton and left in place for twenty or thirty minutes or longer. While it is likely that immunization occurs when mass-cultures of intestinal bacteria are swallowed, we are disposed to fear too active absorption from the very delicate and highly vascular nasal mucosa. There is no way of limiting such absorption of toxins; and we are mindful of one case, an elderly man with chronic ethmoiditis, who experienced an immediate and alarming increase of arterial tension, with considerable albuminuria.

Three years ago, with the advice and counsel of Dr. Robert L. Benson and his department of the Medical School, we undertook a study of numerous private cases of intractable sinus disease, and the results of this study were presented before the American Laryngologic Association last summer. We were thoroughly cognizant of the fact that vaccines had been tried and found wanting a decade before, but were looking for the reason, which we sought in a new study of the bacterial flora of the sphenoethmoidal region. People with apparently incurable sinus disease are found in the practice of every rhinologist. They have been operated on repeatedly, they fall ill every winter, lose hope, and become last-resort cases. Some few become protein-sensitive, following the long infective process.

Here we grouped a few asthmatics; sphenopalatine neuralgias; relapses after complete operation; inoperable cases: pregnant women, marantic children, the aged; diabetics, albuminurics; the high anemias and hemophiliacs; septicemia; heart cases; the tuberculous.

We were much surprised to find the preponderance of hemolytic organisms, and proceeded to use vaccines based on these organisms in the treatment of all cases of the series, in which they were found. We felt that hemolysis might be taken as a rough index of the amount of damage suffered by individuals thus infested. A control series was run with autogenous nonhemolytic streptococci; and to test the value of alien protein injection we used typhoid vaccine on three cases. Stock vaccines, and even polyvalent autogenous vaccines, on account of their variable protein content, did not appeal to us except as rather unstandardized methods of stimulating the defensive mechanism of the blood.

Each sphenoethmoidal region of each case was cultured by platinum loop (not swab) upon two media, broth and agar slants, to both of which citrated human blood was added. Plating out was done upon human-blood agar. Details of this work are available elsewhere.

Of fifty cases studied, thirty showed hemolytic organisms. Hemolytic staphylococcus albus was found in 28 per cent, hemolytic staphylococcus aureus in 48 per cent, and the long and short chain hemolytic streptococci in but 24 per cent of this series. Repeat cultures were needed in ten cases to secure a predominant culture of the suspected organism.

Ten cases showing nonhemolytic streptococci were run as controls. Three asthmatics without hemolytic organisms were tested with typhoid vaccine; and the remaining seven cases, presenting neither hemolytic organisms nor streptococci, were not considered further in respect of vaccine work.

Beginning with 0.05 c.c. in children or asthenics, and 0.1 c.c. in adults, advancing 0.1 c.c. every four days to the lower limit of reaction at 0.3 to 0.5 c.c., after which weekly injections are made, it was found readily possible to avoid the dangers of overdosage and of induction of the negative phase of anaphylaxis. Initial reaction, betokened by slight fever or by tiredness or achiness the following day, was often rather marked, and may be considered a criterion of the eventual benefit of the treatment. Repetition of the cultures in six weeks to two months is recommended in order that vaccines used may be abreast of the continuing infective process. We used 47 vaccines in 30 hemolytic cases.

Sphenoid, ethmoid, turbinate or septum operations had been done by various operators at periods from a few months to ten years before in 24 of the 30 hemolytic cases and 5 of the 10 nonhemolytic streptococcic controls. Most of these people, while appreciative of the help which surgery had temporarily afforded them, objected to or were physically unable to undergo further surgical procedures. Anemia of marked or moderate degree was a notable factor.

Intractable cough in six cases was a symptom receiving speedy relief, especially in two children where it resembled whooping-cough. Seven cases of asthma were cured. Constant low fever (99° to 100.6°) was brought down in six cases, of which one was a malignant endocarditis, bedfast for months. Two injections of her vaccine stopped the febrile reaction, and this patient was able to be up and about after four weeks, and still remains relatively well in spite of her leaky valves.

With the nonhemolytic streptococcic infection, 30 per cent were cured, all after the lapse of some time. No change (except severe reaction to each injection) took place in the typhoid control cases.

The ultimate value of hemolysis as a criterion for the clinical usefulness of vaccines in rhinology must rest upon the consideration of many more cases than our short series, and such work is under way in several places.

Such are a few of the problems upon which medical rhinology is working, in an effort to retain its perspective, and to consider its field as but one portal through which disease may force its way into every part. May I express the hope that our guides and mentors, the anatomists, pathologists and bacteriologists, will continue working in the spirit of Confucius, who said (two thousand four hundred years ago)

"He who is able to get to the bottom of the law of being of men will be able to get to the bottom of the laws of physical nature, and . . . . thus . . . . to influence the forces of creation of the Universe."

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BEZOLD'S MASTOIDITIS AND BLOOD COUNT IN THIS DISEASE*

L. H. KLEMPTNER, M.D., F.A.C.S.
SEATTLE, WASH.

This is a mastoid abscess which breaks through the mastoid process at the tip or inner wall into the subjacent tissues of the neck. The Germans call it "Senkung's Abscess," a sinking or gravity abscess. Bezold first, and as early as 1874, published a number of anatomically and clinically well studied cases in "Monatschrift fuer Ohrenheilkunde."

The predisposing condition favoring Bezold's disease exists when the cortex of the tip and internal wall is thinner than the external wall. This is often the case in pneumatic mastoids. If the perforation occurs at the tip, at the insertion of the sternocleidomastoid muscle, the abscess develops in that muscle. These abscesses are superficial, growing very slowly through breaking down of muscle tissue, and are confined to the upper part of the muscle.

Here is a case in point: Dorothea P., ten years old, contracted a cold on January 14, 1925. One week later a profuse discharge occurred from the right ear, and three days later a swelling of the neck developed, whereat the discharge from the ear abruptly ceased.

I saw the patient February first. She was an undernourished, pale girl with a temperature of 100.2° and pulse of 100. She kept her head bent to the right and turned toward the left. Head movements were very painful. The lowest part of the mastoid and subjacent tissues formed one continuous swollen mass, which was hot, tender and fluctuating. The tip of the mastoid was not palpable. The auditory canal was dry and a small perforation was seen in the anterior and inferior part of a swollen and red ear drum. Adenoids and tonsils removed five years before.

X-ray of the mastoid showed cells not well marked on either side, with considerable increased density on the right. Blood count: Leucocytes 16,811, poly's 63, lymphocytes 37.

The diagnosis was plain. The history, especially the statement that the discharge stopped with the swelling of the neck, the position of the head, the location and fluctuation of the swelling, all were characteristic.

Mastoidectomy revealed, first, the lateral sinus denuded of bone, covered with granulations, and situated very near to the posterior wall of the external canal; second, a perforation of the mastoid tip connected with a large abscess of the sternocleidomastoid.

After the mastoidectomy an opening was made at the lowest point of the muscle abscess. The patient made a complete and rapid recovery.

Two months later the patient and whole family acquired influenza. The ear began to discharge again, a new swelling appeared in the neck, and a week later the patient was again in the hospital. The mastoid was tender, and somewhat painful; large cervical glands were present.

There was a scant discharge from the ear, and the perforation noted above was seen in the swollen ear-drum. The temperature was 101.4° and pulse 110. Blood count 20,000, poly's 85, lymphocytes 15, a less favorable result than before.

On reopening the mastoid the same pus and granulations were found in the antrum and mastoid cavity, and the denuded part of the sinus was covered with ulcerating granulations.

The next six days after the operation the patient was greatly improved, the enlarged glands in the neck disappeared and ear discharge ceased, but the temperature fluctuated between 100° and 104°. On May eleventh a slight chill occurred. The urine contained five per cent of albumin, an occasional blood cell, few pus cells and no casts. Probing of the sinus on May eighth gave pus containing streptococcus mucosus.

The dura was now exposed backward until it appeared normal and also downward toward the bulb, and the whole anterior sinus wall was removed, together with a clot at the upper end, when free bleeding appeared. The internal jugular was not ligated. I decided to await further developments, as the patient was in good general condition.

The day after the operation the temperature dropped from 104.8° to 97°, and then fluctuated between 98° and 102.5° for six days more, when it dropped to normal. The urine was now free of albumin and the wound healthy.

A Bezold's mastoiditis presents a more serious aspect when the abscess breaks through the internal wall of the apex of the mastoid.

Louisa T., 7 years old, came down with measles Jan. 4, 1924. Two days later she had a severe right earache. Next day I was called and found a pale, thin girl, having a temperature of 100° and a pulse of 120, with a diffuse, macular rash over her entire body. Adenoids and inflamed tonsils were noted. The right mastoid was tender, but not swollen. There was a cervical adenitis below the tip. The ear-drum was swollen, but there was no drooping of the posterior, superior wall. Paracentesis was made and the ear began to discharge profusely; the pain ceased, but the fever continued high.

X-ray showed marked clouding of the entire right mastoid area. Blood count: Leucocytes 40,000, poly's 95, lymphocytes 5. Mastoid operation: Very thick external wall, pneumatic type, filled with pus, cells broken down, sinus exposed. A small perforation in the internal wall of the mastoid tip was found. Mastoidectomy, leveling of the mastoid tip, and enlarging of perforation were done. A smear of the pus gave gram-positive streptococcus mucosus.

The patient made a very slow recovery. The temperature continued at about 100° for a whole month. A blood culture was negative. There was considerable discharge from the perforation in the mastoid, through which a probe passed to the base of the skull. Twice luxuriant granulations blocked the perforation and the fever rose to 103°. Recovery came at last. The blood count before the patient left the hospital was: Leucocytes 14,800, poly's 67, lymphocytes 33.

Another patient, Mildred B., 5 years old, contracted a right earache, March 9, 1925. Six days later there was a severe left earache with discharge from both ears. On March 16 I saw the patient for the first time. She was very nervous and impossible to examine properly. Her temperature was 103°, both mastoids were tender but not swollen, there were enlarged and tender cervical lymph nodes, and a profuse mucopurulent discharge from both ears.

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There was drooping of both posterior superior canal walls and perforations in the posterior part of both drums. Adenoids and tonsils absent, having been removed two years previously.

X-ray disclosed mastoids cloudy, but there was no visible destruction of cells.

Blood count: Leucocytes 12,000, poly's 79, lymphocytes 21.

Double mastoidectomy. Thick external walls in both mastoids which were of the pneumatic type. Their cavities were filled with mucopus, much necrotic bone, bleeding profusely.

The temperature continued about 100° for ten days, when a large swelling of the right peritonsillar region and lateral pharyngeal wall appeared. A great amount of pus was evacuated by the knife and the temperature dropped to normal and remained so. It was impossible to determine by what route the pus reached the pharynx. No perforation in the mastoid was found.

When a perforation occurs at the incisura mastoidea, at the insertion of the digastric muscle, the pus may gravitate along the tendon of the muscle toward the pharynx and floor of the mouth. It may break through a thin wall of the middle ear and burrow toward the pharynx along the eustachian tubes.

But gravity abscesses of this kind do not always end as happily as in the three above described cases. It takes, for instance, a long time for an abscess of the sternocleidomastoid muscle to break through the fascia but, once this happens, the pus spreads rapidly in all directions and the prognosis becomes grave. It burrows between the deep fasciæ of the neck, to the mediastinum, spine, chest and to the pharynx.

One may see such patients late in the disease, after all the signs of acute ear trouble have passed, and the diagnosis may be very difficult. One may mistake such cases for abscess of the deep cervical glands, osteomyelitis of the vertebræ, or even for muscular rheumatism.

The Blood Count in Mastoiditis. It is quite difficult to decide in a given mastoid case if operation is indicated. Especially so in the beginning, when typical symptoms and signs are absent.

I felt this quite keenly in an epidemic of measles in 1923-24, when a virulent type of ear complication occurred, and single and double mastoiditis developed over night, with considerable bone necrosis.

I cited above the case of a girl who in two days had a perforation in the digastric fossa. The mastoid was only slightly tender and not swollen, and there was no drooping of the superior, posterior canal wall.

Experienced otologists have often expressed their difficulties in estimating mastoid involvement. Dr. Jenker says: "Experience teaches that there may be destruction of bone exposing sinuses and the dura of the posterior and middle cranial fossæ without any noticeable signs of mastoid trouble. If one waits in such cases to get more certain evidence, he will have more fatal cases."

Most of the surgeons emphasize the bulging of the posterior superior wall of the canal as the most reliable sign of a mastoid complication. But this is often absent. I believe that bulging of the posterior superior wall, with profuse discharge from the ear in adults, and especially older persons, are absolute indications for operation. But I have seen drooping of the posterior wall of the canal in children disappear spontaneously under conservative treatment.

X-ray has been quite disappointing to me. For example, a report reads: "Infiltration of mastoid cells but no visible bone destruction, or only some cloudiness." And at operation one finds very considerable bone destruction. One experiences still more difficulty with the x-ray when both mastoids are involved, in discriminating between the side more and that less diseased.

McKernon, as long ago as 1907, called attention in the *New York Medical Journal* to the importance of a blood count in the diagnosis of mastoiditis. Dixon emphasized it again in the Annals of Otology for 1913. Roseno pleads for it in the Archives of Laryngology of 1924.

Among the cases of Bezold's disease just cited, the girl with the sternocleidomastoid abscess had a blood count of 16,000, poly's 63, lymphocytes, 37. Later with the grave complication of sinus phlebitis, the count increases to 20,000 leucocytes, with 85 per cent of polymorphonuclears.

The second girl, with the perforation in the mastoid notch, had a leucocyte count of 40,000 with poly's 95, and small lymphocytes 5. She had been sick with measles three days, with earache two days. There was but slight tenderness over the mastoid, but no swelling or drooping of the posterior superior wall of the canal. The measles might have caused the fever complicated by middle ear disease, but the blood count revealed the danger, as in measles we have rather leukopenia.

In the third child, where a double mastoiditis was complicated with a right sided pharyngeal abscess, the leucocytes were 12,000 and the poly's 75 per cent. In an adult such a leucocytosis would not have been so suggestive, but in children the number of white cells is about 7,000 and the proportion between the poly's and the other white cells is as 40 to 60.

Another patient, Ralph W., 8 years old, was seized with right earache on March 2, 1925. The temperature was 102.6°, but there were no signs of mastoid trouble. I made a paracentesis, but the fever did not abate and the mastoid became tender the next day.

X-ray: Cells cloudy, but otherwise well defined, no bone destruction. Blood count: Leucocytes 22,000, poly's 80 per cent. Mastoid operation revealed pus and dead bone in the mastoid cavity. A leucocyte count six days later gave 8,500 white cells, and 60 per cent poly's.

Instructive is the following case I have now under treatment: James O., 11 years. Pain and profuse discharge from right ear for fifteen days and pain in left ear one day. Temperature 101°, right mastoid tender, but not swollen, sacking of posterior superior wall of right ear. Left ear drum swollen and bulging.

X-ray: No evidence of cells or cellular structure in either right or left mastoid. Blood count: Leucocytes 17,500, poly's 91, mono's 9.

Mastoidectomy on the right side and paracentesis of left ear-drum on March 9. The right mastoid was filled with necrotic bone. On the third day of the operation the temperature was normal and a blood count on the sixth day showed leucocytes 15,000, poly's 76, mono's 24.

Very interesting was the case of two sisters with scarlet fever and middle ear inflammation, respectively, five and seven years of age. The older child had a temperature of 99.5°, drooping of the right posterior superior wall, with a tender but not swollen mastoid, and in very good general condition. The blood count was: Leucocytes 12,000, and poly's 70. I did a paracentesis and waited a few days, when the blood count rose to 16,000 and the poly's to 75 per cent. I therefore decided to operate, and did not regret doing so, since both pus and bone destruction of the cells were found in the mastoid cavity.

Two weeks later the younger sister contracted a left middle ear inflammation. Her temperature was 100°, the mastoid was tender but not swollen, there was swelling of the submastoid glands, drooping of the posterior, superior wall and a purulent aural discharge, just as in the case of the older sister. But the leucocyte count was 6,500, and poly's 48 per cent. The general condition was good. After a few days another blood count was made, which was just as satisfactory, and the child made a rapid recovery.

I should like to report a further experience with the older sister, ten days after recovery from the mastoid operation. The temperature suddenly rose from normal to 100°, the nose began to discharge bloody serum, there was a renewal of the ear discharge, and the mastoid wound became covered with a grayish membrane. A pure culture of diphtheria bacilli was obtained from a smear. After injection of 10,000 units of antitoxin the patient made a rapid recovery. The infection was contracted from an adjacent diphtheria ward.

A blood count is a very important aid in making an early diagnosis of mastoid inflammation in doubtful cases. In a few of those cited it was superior to other signs or symptoms in affording early information as to the desirability of operation.

In closing, I would add I recognize that a leucocytosis, as is the case with all laboratory tests, is not certain evidence of acute mastoiditis and that the number of cases I observed is too small to make definite conclusions. But I call your attention to this valuable aid and ask for a more thorough study of this symptom.

THE PARAFINE TREATMENT FOR BURNS AND DENUDED AREAS*

Donald V. Trueblood, M.D.
SEATTLE, WASH.

This particular subject was undertaken for two reasons, first, to counteract, if possible, the unfavorable criticism appearing frequently in surgical literature regarding parafine as a therapeutic agent for burns; and, second, to call attention to its use in the treatment of any denuded area.

Burns do not differ essentially from other traumatic wounds. They all destroy more or less tissue, suddenly subjecting the individual to shock, primary shock so-called, thereby differentiating it from secondary shock which is a much severer condition following close upon the organism's satisfactory reaction from the first.

Many theories have been advanced to explain the cause of the profound systemic symptoms ushered in with this secondary shock, their number alone suggesting the inadequacy of any one. It is not within the scope of this paper to mention or discuss the respective values of them. The recent articles of Davidson, or Ravdin and Ferguson cover these hypotheses sufficiently. However, all seem to agree that devitalized tissue and infection play some part in the general symptoms which appear. The majority of observers hold the opinion that there is a definite toxemia from poisons derived by absorption from split proteins.

An area that is traumatized, burned, torn or crushed suffers, first, the destruction of tissue; and, second, is burdened with the task of ridding itself of this devitalized material. Natural processes will cause gradually a demarcation between the viable and dead cells, eventually causing the necrotic portions to be sloughed off. But such a process is slow, so slow that the organism might suffer so severely from this secondary traumatic shock as to die before the above schedule could be completed.

This cleavage between the good and the bad tissue, debridement so-called, ushered in by nature, can be performed by the surgeon at once. The recent World War revived this ancient surgical principle with tremendous emphasis. Rather than allow untoward effects by absorption from such an area, a thorough debridement should be performed under a general anesthetic, or according to the local anesthetic method of Ravdin, as soon as the primary shock has been sufficiently weathered. This may entirely prevent the development of toxemia. Should general symptoms appear, however, despite this treatment, energetic efforts such as described by Ravdin and others are indicated. We are concerned here only with the lesser task of treating the local injury, not the general one.

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In passing, it might be mentioned that we are well aware that during the stage of secondary shock it is more vital to treat the organisms as a whole than to care for any diseased area, but after control has been obtained of this systemic disorder, the local treatment is of primary importance. The defect must be repaired with as little scarring and deformity as possible. The bed-ridden patient must be made ambulatory as soon as expedient, possibly returning to part of his work. The local treatment should sooth the patient, not harass him with pain. The dressings should be devised to aid healing, and not retard efforts of nature. Aseptic conditions should be maintained. The writer believes that the above requirements are answered completely by the parafine method.

After the wound has been relieved of its dead (debrided) tissues, it should be sterilized as completely as possible. Mild, nonirritating antiseptics, such as boric acid, Ochsner's solution, mercurochrome, picric acid or Dakin's can be used. This sterilizing process should not be prolonged in order to produce a negative culture, for the reason that any raw area permits loss of body heat, also fluid loss, and is painful. Twenty-four hours is usually ample time.

Furthermore, and I cannot emphasize this point too strongly, the repeated traumatizing of the fresh granulations, caused by the continuous application of these medicines and compresses incur pain and, more unfortunately, also induce fibrous and exuberant granulations and are apt to cause bleeding. It is much better to test the degree of infection present by sealing up this raw area with parafine than to prolong meddling. Then, if active infection is present, the cardinal evidences of inflammation will appear; if not, you have gained considerable time, stopped the pain completely, retarded profuse granulation, and placed the raw area in a better healing environment.

Parafine should never be placed on a wound harboring necrotic tissue. Nonrecognition of this error has done much to bring the treatment described into disrepute. Occasionally it can be placed directly upon the untreated face of a second degree burn, as such an area is probably sterile and possesses very little necrosis. The wax cuff to such a wound is similar to a primary suture.

After the area has been debrided of dead tissue and sterilized, the parafine is placed on it by means of a spray or soft brush. Applying it just before the solution solidifies causes less sting due to the heat. The spraying apparatus should be held first at some distance from the wound, gradually bringing it closer as the parafine accumulates and the wound becomes less sensitive to the impact of both parafine and wind. Application of the parafine is continued until there is a layer two or three mm. thick over the entire wound and overlapping the edge of the skin by at least an inch. This cuff is bandaged or held by adhesive to the surrounding parts so that it does not slip. Such a dressing, even when large, can permit the patient to be up and around when most other methods would not. The freedom from pain after such a dressing is often dramatic, especially if the dressings before had been of some other type. Dressings should be repeated daily and oftener if the seropus formed under the wax is profuse or produces an odor. The discharge is blotted off with cotton pledgets moistened in boric acid, the area dried and a fresh dressing of parafine replaced.

The discharge that accumulates under this film has been the cause of much adverse criticism of the method. Some have said it is evidence of sealing up infection and contrary to surgical principles. Seropus to them means infection, when, as a matter of fact, such a wound might be absolutely sterile, there being no organisms present, and the discharge being lymph and serum, laden with hungry leucocytes, poured into the raw area by the granulations. It is the normal secretioin of granulating surfaces; none of the cardinal symptoms of inflammation are present. Horsley's article on "Surgical Drainage from a Biological Point of View" explains the accumulation of discharge as the pouring out, into the granulating area, of lymph following a reversal of lymphatic circulation. At times the discharge is so great that it seeps out under the dressing. Under such conditions, of course, dressings should be made more frequently, especially as they are painless and economical. Infection can be detected at an early date, if the wound is carefully watched.

When parafine has been started early, before excessive granulations have been established, it seems to prohibit their exuberance or overgrowth. If, on the other hand, profuse granulations have become established, parafine will stop their progress.

The author has never seen such excessive granulations appear under the parafine treatment as he has seen in other methods. Many advantages accompany this particular characteristic of parafine treatment. First, the delicate membrane of epithelium pushing out from the skin edge can progress faster over a subdued granulating base. Second, the shallower the granulations, the less scar is formed, which in turn is followed by less contractions and consequently less deformity.

Another point of advantage with the method is that, having originally a sterile wound, such as an untreated first or second degree burn, or having sterilized a debrided area, such wounds can be kept aseptic by the application of sterile parafine. The melted parafine is sterile and closes the wound up with an aseptic cover. Subsequent dressings do not contaminate the wound. Many other treatments in vogue have not this element of safety. It is virtually a secondary suture.

Furthermore, the impermeability of the film applied prohibits fluid loss by dehydration and heat loss by radiation. Dehydration was and still is considered as one of the causes of pain in raw areas and as a preventive. The old treatments consisted in covering such an area with anything that was handy. Often relief of pain was secured by this covering. Subsequent dressings, however, were a trial to both patient and surgeon. Parafine protects against dehydration, heat radiation, and offers painless dressing throughout the process of healing.

All granulating aseptic wounds must be covered with epithelium as soon as possible. Speed is necessary for two reasons, first, to decrease the time spent from work and, second, to decrease excessive formation of fibrous tissue. Such tissue is being formed continually in the base of the wound, later to demonstrate itself in scar and contraction. Parafine has retarded the formation of this tissue and by doing so has prepared the field for rapid epithelization. It has protected the first, fresh granulations formed. It has maintained an almost sterile wound. and it supports in a splinting manner the delicate membrane of epithelium that has advanced out over the bed of granulation from the skin edge, or has sprung from the islands of epithelium that escaped destruction elsewhere in the wound. It is surprising to observe how rapid this membrane advances over such a field. Each dressing discloses rapid progress.

The protection afforded by this cuff of wax against further trauma to the wound is very important. Compresses cannot possibly be placed on and off such a wound without adhering to its edges, thereby tearing the delicate new skin or causing the granulations to bleed. Any covering to which cells can attach or fibrin adhere causes trauma. Parafine does neither. Should it be necessary to skin graft later a part of the area, after parafine treatment has been used, the field is ready. The right kind of granulation base has been prepared for either the skin graft or the growing skin.

The following cases briefly outlined are illustrative.

Woman, age 60, caught her hand in an electric wringer and it was drawn into the machine up to the carpal bones. Fortunately no bones were broken, but the skin and soft tissue were torn off the dorsum of the hand from the carpal bones to the knuckles, leaving the extensor tendons of four fingers exposed. A debridement was done under general anesthetic and the remnants of soft tissue were put in place without tension. A wet Ochsner's solution dressing was applied for twenty-four hours and then parafine treatment instituted. There was a raw area three and one-half by two inches, exposing at its base the four extensor tendons. Nothing but parafine was used. Gradually the new skin coming in from the margins covered the wound without sloughing of tendon or other tissue. When covered, massage and passive motion were instituted.

The patient was free from pain from the start of the treatment and the tendons are not adhered to their new covering. The only disability was that the flexion at the wrist was slightly limited for a time, but has since entirely disappeared. I believe that the absence of excessive granulation accounts for the freedom of the tendons.

Woman, age 35, caught her hand in a steam laundry press. Four fingers were crushed as well as burned on the dorsum. The extensor tendons of the second, third and fourth fingers were exposed from the middle of the proximal phalanx to their insertions. The wound was three days old when I saw it, having been treated by ointments.

There was no evidence of gross infection, but considerable necrotic tissue was present. The wound was immediately debrided and protected with parafine. Gradually all the tendons were covered with epithelium and without sloughing, except a part of the one supplying the third finger, which tendon had been burned at its attachment. The patient has almost perfect function of all fingers, except that the terminal joint of the third finger, where the tendon was burned, is stiff.

Woman, age 30, wife of a physician, was burned with hot water over the side of her face, neck, chest and axilla. This was a second degree burn with small spots, the size of a quarter, which would be classified as third degree. No treatment had been instituted before my arrival and the patient was in severe pain. Parafine was immediately applied with immediate complete relief. This freedom from pain persisted until the patient was discharged. Dressings were daily. The patient was ambulatory. The discharge developed quite an odor for a few days, but soon disappeared. The wound healed without scarring.

Man, age 40, caught his arm in the gears of a large machine, producing crushing wounds in three areas, removing skin and subcutaneous tissue down to the fascia. The skin loss in each wound was about two inches by three, there being a thin bridge of skin between each of them.

A thorough debridement was performed, followed by an Ochsner's solution dressing for twenty-four hours. No suturing was possible. Parafine treatment was instituted and carried out in the usual manner and the wound healed without the skin becoming adherent to the denuded fascia. No deformity or loss of function.

Man, age 30, caught his sleeve in a circular saw, sustaining injury to the volar surface of the wrist, consisting of severance of the palmarus longus, flexor carpi radialis and a superficial branch of the median nerve. The wound was ragged, three inches of skin having been sawed away and the superficial fascia was removed over almost as large an area. An inch of each of the cut tendons had been shredded.

Treatment: The wound was debrided. Extreme flexion of the wrist was necessary in order to reattach the shortened and severed tendons. There was not enough soft tissue to cover the sutures or the tendons. Ochsner's solution dressing was applied for twenty-four hours and the parafine treatment instituted. There was some tissue slough, due probably to too much tension on some sutures which were placed with the hope of covering the tendons. Nevertheless, the dressings of parafine were continued with no evidence of infection and in a rather short time the wound was covered with new skin. However, before the new skin had completely covered the wound, it was necessary to begin passive motion which delayed, of course, the progressing epithelial membrane. The wound has entirely healed. The man has perfect function of his wrist but has an anesthesia over the area supplied by the cut nerve.

The cases elected are those in which tendons were involved, because they are the types of wounds in which scarring would produce not only deformity but disability and thereby would be tests for the use of parafine. Wounds in other places, such as the back, abdomen, and thigh, causing large areas to be exposed, are not so apt to result in deformity and disability, even though there be considerable scarring. The same principles of healing apply to these areas as well and are supported as admirably by parafine. Of course where the area measures ten to twelve inches, grafting is often necessary.

SUMMARY

1. Parafine treatment of burns and denuded areas offers certain advantages when properly instituted.

2. It is a local treatment and not intended to assist in combatting general toxemia.

3. It should never be applied to a wound or burn prior to a debridement, if devitalized tissue is present.

4. If infection is present, a short period should be allowed for sterilization of the wound by mild antiseptic prior to application of parafine. Twenty-four hours is usually sufficient.

5. A test can easily be made to discover if infection is present by applying the wax and watching developments. Considerable time can be gained by this procedure.

6. Parafine dressings are painless.

7. Parafine dressings do not, by traumatizing or irritating the granulation process, produce the exuberant, granulating tissue seen in other methods.

8. Parafine seems to retard the growth of excessive granulation tissue.

9. Parafine splints and protects the delicate membrane of epithelium.

10. Parafine is economical in itself and in the saving of time for the patient.

11. The seropurulent discharge which accumulates under the parafine dressings must not be taken for evidence of infection.

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Eagleson Clinic.

TREATMENT OF CANCER OF RECTUM BY PERCY CAUTERY AND ENDOTHERMY*

Arthur C. Crookall, M.D., F.A.Pr.S
SEATTLE, WASH.

On account of the increasing recognition of the value of heat in the surgical treatment of cancer in different parts of the body, this short case report is given. First, to show that electrocoagulation or conversive heat is similar in its results to the actual cautery or convective heat, and that heat applied by the former method is not only of much easier application, but can be made as radical as the operator desires. Also that heat as applied through the high frequency does not depend on any electrical reactions, but its results are in every way similar to convective heat as applied with the actual cautery. This is shown in this case because both forms of heat were used on the same patient only four months apart under exactly the same circumstances.

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* Read before the Twenty-sixth Annual Meeting of American Proctologic Society, Atlantic City, N. J., May 25-26, 1926.

CASE REPORT

In August, 1924, Mrs. A., 70 years of age, came to me complaining of backache, rectal soreness and bleeding at stool. Her history and general physical examination were negative. Local examination showed a carcinoma of the anterior wall of the rectum about 1½ inches long and 2 inches wide, immovable on the muscularis. Its lower border was just above the internal sphincter muscle.

Under spinal anesthesia and with the Percy cautery, an incision was made through the sphincters anteriorly and posteriorly, sufficiently long to introduce the Kiger water-cooled rectal speculum. With the large blunt Percy cautery tip, the cancer was baked as follows:

10 minutes	120 degrees Fahrenheit
10 minutes	140 degrees Fahrenheit
10 minutes	150 degrees Fahrenheit
20 minutes	200 degrees Fahrenheit

In three weeks time the wound caused by the treatment was covered with clean granulations without induration or inflammation and the patient returned to her home in the upper part of the state. I felt at the time that the destruction of tissue was not enough, as I had fully expected to get a rectovaginal fistula, if the baking was sufficient in extent.

In three months she returned for an examination, which showed cancerous tissue again appearing in the upper and lower portions of the wound. It was now decided to use thermic electrocoagulation.

In December, 1924, spinal anesthesia was administered and the anal wall anteriorly was incised with the Percy cautery to give room to work. Through a short glass speculum the diseased area, and for a half inch into healthy mucosa, was destroyed by 15 to 30 second punctures of the diathermic needle. The punctures were superficial in the area of apparently healthy mucosa, but made one-half inch deep in the cancerous area. The lower anterior portion of the anal canal, which was not apparently involved, was also treated with deep punctures.

In thirteen days the perineal body, anterior rectal and posterior vaginal wall up to the cervix had sloughed out; also the lateral rectal and anal walls to a depth of one-fourth to one-half inch, leaving only one-quarter of the circumference of the postanal canal and rectum intact to the height of about three inches.

At the present time, six months after the last operation, the patient presents a large, smooth, clean cloaca, bounded posteriorly by healthy rectal mucosa, anteriorly by the vaginal wall, while in its upper portion can be seen the cervix and the upper rectal opening. The scar tissue in consolidating has pulled the rectal mucosa forward and the vaginal lining backward, so that the area of scar tissue is surprisingly small.

The patient feels perfectly well and has no discomfort. She is able to attend to her regular household duties and has no more trouble with her bowels than one would have with a colostomy.

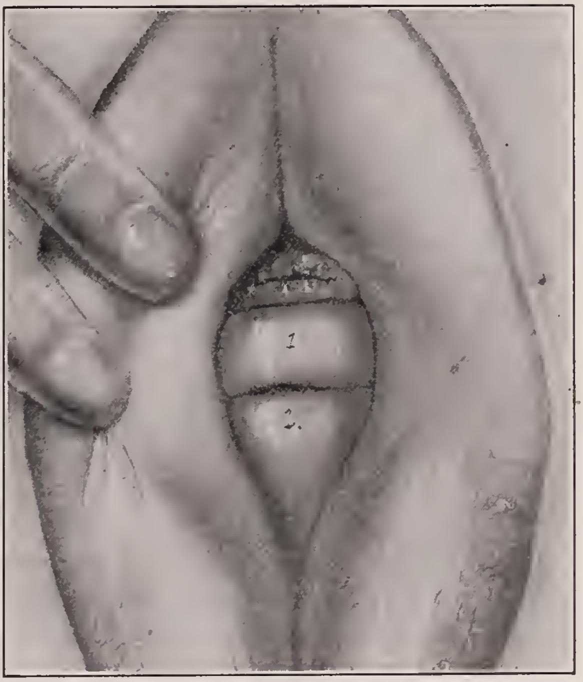
This case is presented to show the comparative action of convective and conversive heat in such cases.

Pain. Following the Percy cautery treatment this was practically nil, the patient receiving only one-quarter grain of morphine the night following operation. Following electrocoagulation there was considerable soreness and irritation, requiring morphine on five occasions and aspirin daily.

Discharge. Was thin and watery and not large in quantity, with the same typical penetrating odor in both cases.

Shock. None. Pulse never went above 100 at any time in either case.

Temperature. The day following each operation the thermometer registered 101° at four p.m. In both cases this was followed by a normal morning temperature, but a rise to about 100° at four p.m. This persisted for eleven days following the Percy cautery, and thirteen days following diathermy.



View of rectovaginal outlet one year after operation. 1. View of vaginal wall. 2. Prolapse of upper rectum.

Slough. The time of the complete removal of the slough is represented by the return of normal temperature in each case—eleven days in the Percy cautery and thirteen days after diathermy.

The appearance and nature of the granulations following each operation appeared to be the same, and in both cases in one month induration was practically absent.

Acriflavine dressings and hot sitz baths were used daily in each case. The period of confinement in bed was four days in the first operation, six in the last, although the patient was in the hospital until all the sloughing was completed.

NORTHWEST MEDICINE
The Journal of the State Medical Associations of Oregon, Washington, Idaho and Montana
Devoted to the interests of the Medical Profession of the Pacific Northwest
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EDITORIAL

THE PORTLAND MEETING

The Oregon State Medical Society anticipated all other medical meetings of the Pacific Northwest by staging its meeting the first of April. The interesting program of papers was somewhat dislocated in consequence of the illness of Dr. Hoover, of Cleveland, whose absence was announced at the opening session. Dr. Emile Holman, professor of surgery at Leland Stanford medical college, presented valuable and interesting papers, indicating the wisdom of his selection as the head of the Stanford surgical department. Dr. George W. Swift, of Seattle, read scholarly papers on brain surgery, demonstrating the fact that he is a leader in that special line. Dr. H. W. Hill, of Victoria, professor of public health at the University of British Columbia, evinced much interest in describing the technic of his manner of vaccination which has become known as the "Canadian method of vaccination." A number of members and visitors sacrificed their arms for a vaccination clinic, later exhibiting the same in competitive evidence of results.

The most largely attended session, and the one developing the greatest interest, was on the last evening, when the subject of periodic health examinations was discussed. The program consisted of demonstrations of the examination of apparently well persons, in which several experts exhibited technical examinations of different organs and parts of the body. This was the culmination of the agitation regarding this line of work, in which several members of the society have been actively engaged. Dr. Stricker, secretary of the society, has been the leader in this particular line of work, the success of which was a source of great satisfaction. The establishment of these systematic examinations under the auspices of the society will become a monument to the success of this annual meeting, which will be worth all the efforts put forth in its behalf.

ATTENTION TO SPOKANE STATE MEETING

The officials of Washington State Medical Association are making plans for the annual meeting at Spokane, June 29-30, which will guarantee this to be one of the most attractive and delightful meetings in the history of the association. Beside papers presented by the members of the association, the outside attractions will consist of Dr. Howard Lilienthal of New York, professor of clinical surgery at Cornell School of Medicine and consulting surgeon of Mount Sinai and Bellevue Hospital, who will read a paper on the thirtieth; and Dr. H. Lisser of San Francisco, assistant professor of medicine and endocrinology of University of California, who will present papers on the twenty-ninth and thirtieth. The preliminary program is presented below. The full program will appear in next month's issue.

The Committee of Arrangements is making extensive preparations for the entertainment of doctors and their wives. County health officers will hold their annual meeting at the Davenport Hotel, June 28-29. The Public Health League will hold its luncheon and general meeting at the Davenport Hotel on the twenty-ninth.

PRELIMINARY PROGRAM

TUESDAY, JUNE 29

9:00 a. m.—Board of Trustees.
9:30 a. m.—House of Delegates.
11:00 a. m.—Dr. H. Lisser, San Francisco.
12:00 m.—Public Health League Luncheon and General Meeting.
2:00 p. m.—Local Papers.
7:15 p. m.—Entertainment.

WEDNESDAY, JUNE 30

9:00 a. m.—House of Delegates. Election of Officers.
10:00 a. m.—Dr. Howard Lilienthal, New York City.
11:00 a. m.—Local Paper.
2:00 p. m.—Dr. H. Lisser, San Francisco.
Local Papers.
7:30 p. m.—Entertainment.

A special feature of the meeting will be the Washington State Medical Golf Tournament, that will be held at the Spokane Country Club, June 28. All medical golf enthusiasts of the state will plan to be present for this event. The program presented below will be sufficiently attractive to ensure their presence.

WASHINGTON STATE MEDICAL GOLF TOURNAMENT, SPOKANE COUNTRY CLUB

MONDAY, JUNE 28

HEADQUARTERS, DAVENPORT HOTEL

Transportation will be afforded those who appear at the Hotel between 7:45 and 8:45 a. m.

REGISTRATION

Immediately, care of Dr. Arthur Betts, 223 Paulsen Building, Spokane. Send names, handicaps, requests for information or special matches.

ANNUAL EVENTS

1. Washington State Championship, 36 holes, open to all members of the State Association.
2. Washington State Handicap Championship, 36 holes, open to all members of the State Association. Play is for the Horton Cups. Winner takes two cups. One he holds permanently and the other is held after three successive wins.
3. Low net score on handicap, 18 holes, open to all, especially those who may be unable to compete in 36 holes. Must be the first 18 holes played.
4. Shaw Supply Cup, held at present by Seattle. This cup to be contested for by four man teams from the qualifying County Societies.
5. Low net score on handicap for visitors who are not members of the State Association.

SPECIAL EVENTS

I. Eighteen holes on handicap. Each man can enter in his own specialty.
  1. Surgery—Trophy by Dr. A. A. Mathews.
  2. Internal Medicine—Trophy by Dr. F. Epplen.
  3. Pediatrics—Trophy by Dr. P. D. McCornack.
  4. Urology—Trophy by Dr. Wm. Pennock.
  5. Eye, Ear, Nose and Throat—Trophy by Spokane Eye, Ear, Nose and Throat Society.
  6. Roentgenology—Trophy by Dr. C. B. Ward.

II. Blind Holes.
III. Mashie Approach.
IV. Driving Contest.
V. Mid-Iron Approach.
VI. Other events to be arranged later.

Trophies to be given by Spokane Surgical Supply Company, Whitlock's Pharmacy, Hart & Dilatush Pharmacy, Hoag-Meyer X-ray Company and others.

ENTERTAINMENT

Banquet to be held at the Country Club immediately following events of the day, complimentary to all participants, at which time prizes will be given to the fortunate ones. No prizes to be given by proxy.

MORE DETAILS OF PACIFIC NORTHWEST MEETING AT SPOKANE

Arrangements for the meeting of the Pacific Northwest Medical Association at Spokane, July 1-3, are practically complete. The program committee announces the following changes in the program published last month: Dr. Charles R. Stockard, who was to give lectures on "Inheritance and Environment," "Development and Environment" and "Rational Anatomy," has found it necessary to cancel his acceptance and in his place an effort is being made to get a pathologist or bacteriologist.

Dr. Alfred Keidel has announced his lectures to be as follows: (1) Manifestations of Early Syphilis, (2) Management of Early Syphilis, (3) Late Syphilis and the Wassermann-fast Patient.

The meeting place will be in the famous Marie Antoinette room of the Davenport Hotel, where the principal meetings will be held. The afternoon special sessions will be held in the Elizabethan room in the same corridor. Most of the papers will be delivered at the joint morning sessions but a few surgical and medical papers will be separated in the afternoon.

Attention is particularly called to the fact that neurologic surgery is being featured by the presence of Drs. Adson, Dandy and Naffziger, respectively of the Mayo Clinic, Johns Hopkins and University of California Medical School.

Special attention is being given to Surgery in Cancer. Dr. Semken will deliver three lectures on this subject.

Dr. George Dock has added a third subject to his titles, the three now reading: (1) The Anemias. (2) The Nephropathies. (3) This will be a clinic, in which gastroenterologic cases will be discussed, if they are available.

An interesting feature of the program will be Dr. Ivy's reviews of various subjects on physiology, the titles being: (1) Recent Advances in the Physiology of Gastric and Pancreatic Secretion. (2) The Relation of the Gastrointestinal Tract to Anemia. (3) A Review of the Recent Advances in Physiology.

Dr. Howard Lilienthal will discuss in full the Diagnosis and Treatment of Pulmonary Suppuration, both Tuberculous and Nontuberculous.

Dr. Arthur Steindler will discuss various orthopedic subjects, the titles being: (1) Low Back Pain. (2) Scoliosis. (3) The Arthritic Knee Joint.

Dr. H. L. Parker, Associate Neurologist at the Mayo Clinic, will discuss: (1) The Diagnosis of Suppurative Disease of the Central Nervous System. (2) The Clinical Signs and Symptoms of Neuritis.

Dr. J. B. Collip, one of the coworkers with MacLeod, Banting and Best in the discovery of insulin, will give the details of his discovery of parathyroidin and its clinical uses. His other subject will be on The Value of Blood Chemistry in Clinical Medicine.

Dr. George W. Holmes, Massachusetts General Hospital, will discuss: (1) The Roentgen Examination of the Chest, with Special Reference to the Heart and Great Vessels. (2) Bone Tumors: Their Classification and Roentgen Appearance. (3) The Present Status of Radiation Therapy.

Dr. E. H. Mason, of the University Metabolic Clinic at McGill University, will discuss: (1) The Effect of Ultraviolet Light Upon Total Metabolism. (2) Studies Upon Obesity; The Source of Heat During Periods of Reduction. (3) Studies

Upon the Specific Dynamic Action of Foods in Obesity and Undernutrition.

Dr. J. Whitridge Williams of Johns Hopkins will give the following three lectures: (1) Lantern Demonstration, Illustrating Certain Contracted Pelves, Together with a Consideration of the Use of Cesarean Section. (2) Prophylactic and Actual Treatment of the Toxemias of Pregnancy and Eclampsia. (3) A Study of the Placentation and Course of Labor in Multiple Pregnancy.

Hotel reservations may be made by writing to Dr. Geo. H. Anderson, 422 Paulsen Bldg., Spokane, after registration has been completed, or the registration fee and hotel registration may be made directly to Dr. F. Epplen, 422 Paulsen Bldg., Spokane, the usual registration fee of ten dollars being in operation. Advance interest assures a large attendance.

MONTANA ANNUAL MEETING

The annual meeting of the Medical Association of Montana will be held at Billings, July 16-17. It will be preceded by the meeting of Montana Health Association, July 14-15, and that of the Montana Academy of Oto-Ophthalmology July 15. The tentative program which has been prepared will include papers by Drs. W. J. Mayo, Balfour and Des Jardins of the Mayo Clinic; L. Webster Fox, Philadelphia; Morris Fishbein, editor of the A. M. A.; R. C. Coffey, Portland; Henry Schmitz, Mercy Hospital, Chicago; Fred Adair, professor of obstetrics, and F. C. Rodda, professor of pediatrics, University of Minnesota; A. D. Dunn, professor of medicine, University of Nebraska, and Fred N. Allen, of New York City, expert in diabetic diet. Papers from the Montana profession will include those by Drs. T. C. Witherspoon, C. B. Rodes, A. W. Morse and J. R. E. Sievers, Butte; M. D. Winter, Miles City; C. C. Albright, Great Falls; F. X. Newman, Helena; C. E. K. Vidal of Galen and F. S. Modern of Wibaux. Papers from other Montana physicians are also expected.

Entertainment features of exceptional interest will be prepared, including golf, fishing, swimming and trips to the mountains for those who remain over Sunday, the eighteenth. A special effort is being made to attract commercial exhibits, including nationally known supply and book houses. A meeting place has been chosen with abundant space for scientific meetings and exhibit sections. Not only are the doctors of Montana urged to attend this meeting but also physicians from adjacent states who will receive a warm welcome. It is believed that the national reputation of many of the men above mentioned on the program will be an unusual inducement to bring together a large attendance.

MEDICAL NOTES

OREGON

Hospital to be Enlarged. A new wing is to be constructed at The Dalles Hospital at a cost of $60,000. It will be of concrete and steel, containing thirty rooms. Two more similar units will be built later to replace the present wooden structure. This will give an accommodation of one hundred rooms, which ultimately will be increased to one hundred fifty.

Hospital Desires Library. Wesley Hospital, at Marshfield, proposes to establish a library for the use of its patients. An appeal has been made to the public to send to the hospital books of fiction and other character that will be of interest to patients.

Hospital to be Established. A new twelve-room hospital, for the accommodation of fifteen patients, has been established at Bandon. A residence has been purchased for this purpose, which is being remodeled into a modern hospital. It will represent an investment of $6,000 and will be a valuable addition to the community, whose patients have hitherto been obliged to go elsewhere for hospital care.

New Name for Hospital. The hospital at The Dalles, heretofore known as the Hamilton Hospital, has been renamed the "Mid-Columbia." This name was selected from a number presented on a prize contest.

Emergency Hospital Established. An emergency hospital has been opened at Reedsport in rooms formerly occupied by the American Legion. Drs. H. C. Eastland and Charles Billington will be in charge.

New Health Officer Chosen. Dr. D. R. Thompson, of Grants Pass, has been selected by the Oregon state board of health for the position of health officer for Douglas county. He takes the place made vacant by the resignation of Dr. W. C. Belt.

WASHINGTON

The Golf Tournament. All golf devotees should note the golf tournament at Spokane which will precede the State Association meeting. All members of the Association are eligible as contestants. Suitable handicaps will place everyone in the running.

Ambitious Plans for New Hospital. Plans are being let for an addition to the Norwegian Hospital in Seattle, which is located in the northern part of the city. It is proposed to construct a building to cost $250,000. The present building will be retained for use as a nurses' home.

New Wing to be Constructed. Bids have been called for the reconstruction and equipping of the north wing of the Northern Pacific hospital at Tacoma. This will increase the capacity of the hospital from 100 to 135 beds. Two years ago the reconstruction of the main wing was completed, making the institution thoroughly modern and up-to-date according to hospital standardization. One floor of this wing will be utilized for a maternity ward with nursery and allied accommodations.

Work Started on Sanatorium. Construction has begun on the first unit of the Pierce county sanatorium building on the grounds of the old building on Pacific Avenue. This unit will be 117 by 118 feet and two stories high. This will be an administration building and will contain thirty-nine beds. Other units to be added later will increase the capacity to one hundred beds.

Northwest Hospital Association will hold its semiannual meeting in Portland May 3-4. It will be attended by delegates representing hospitals from Washington, Oregon and Idaho. Speakers will include Drs. McEachern, of the American College of Surgeons, and Matthew O. Foley, editor of Hospital Management. President of the association is C. J. Cummings, superintendent of the Tacoma General Hospital.

Secretary to National Organization. Dr. Maud Parker, of Seattle, was last month elected secretary of the Medical Women's National Association. This organization held its annual meeting at Dallas at the time of the meeting of the American Medical Association.

Relieved from Office. Dr. J. I. McKelway, who formerly practiced at Yakima, and for several years was assistant superintendent at the Steilacoom hospital, recently was suddenly removed from office. Dr. Frank Dwyer, of Sedro-Woolley, has been appointed to the position vacated by Dr. McKelway.

Dr. D. D. Dement, who has served for several years as lieutenant, medical corps, U. S. Navy, has resigned his commission. He has located for practice at Bremerton.

Elected President. Dr. E. J. Lawrence, of Spokane, was recently elected president of the University Club of that city.

Dr. J. E. Pruecel, who has practiced for the past seven years at St. John, has located at Colfax. He will assume the practice of Dr. Frank St. Sure, who has moved to Los Angeles, where he will practice for the future.

Elected President. The Reserve Officers Association of Walla Walla held a meeting April 19, at which Dr. C. J. Johannesson was elected president.

Dr. J. H. McCormack, of Ellensburg, has sailed for Europe for an absence of seven or eight months. He will spend most of his time in Vienna on eye, ear, nose and throat work.

Dr. W. F. Diffenbacher, who has resided at Caldwell, Ida., for twenty-five years, has located for practice at Spokane.

Dr. J. J. Mustard, of Olympia, who has been confined to bed with illness for several months, is improved and getting about again.

Dr. S. A. McFetridge, formerly of Vancouver, has located for practice at Coupeville.

Dr. J. H. McArthur, who has hitherto practiced at Mt. Angel, Ore., has located at Oakville.

Medical Wedding. Dr. Albert B. Murphy, of Everett, was married to Miss Vesta Kruse, of Rochester, Minn., April 5, the wedding taking place at Ellensburg.

IDAHO

Full Time Health Officer Endorsed. The plan of having a full time health officer for Canyon county, assisted by a trained nurse and assistant, has been endorsed by the Nampa Kiwanis Club. The annual cost will be $7,500, of which the Rockefeller Foundation will pay one-third.

Meeting of Medical Examiners. The state board of medical examiners held a meeting at Boise April 6. The board consists of Drs. F. A. Pittenger and A. L. Stewart of Boise; J. C. Dwyer, Coeur d'Alene; C. R. Scoot, Twin Falls; A. N. Newton, Pocatello, and A. H. King, Montpelier. There were seven applicants for licenses, five by examination and two by reciprocity.

Upper Snake River Medical Society held a meeting last month, electing Dr. T. A. Ellison, of St. Anthony, president and Dr. W. W. Sutherland, of Rexburg, secretary.

MONTANA

Annual Meeting of Board of Health. The state board of health held its annual meeting at Helena April 2. Dr. L. H. Fligman, of Helena, is president of the board and Dr. B. L. Pampel, of Livingston, is vice-president, these officers being reelected for the ensuing year. The other members of the board are Drs. E. M. Porter, Great Falls; E. G. Balsam, Billings, and G. M. Jennings, Missoula. Dr. W. F. Cogswell, of Helena, was reelected executive secretary of the board for the ensuing four years.

OBITUARIES

Dr. William D. Valentine, of Spokane, Wash., died March 21 from complications following pneumonia, aged 76. He was born in Lewisburg, Pa., in 1850. He received his early education in Illinois, where his family moved during his childhood. After graduating from medical school he began practice at Polo, Ill., in 1880. He settled in Spokane in 1884, and at the time of his death was the oldest practicing physician in that city.

Dr. Harold E. Bates, of Portland, Ore., died March 30, following a seven years' illness from tuberculosis contracted in France during the war. He was 37 years of age. He was born in Portland, and graduated from the University of Oregon in 1910 and later received a degree from Johns Hopkins University medical school. He entered the army service during the World War under the British flag, serving with a Harvard unit in 1916. While in this service he suffered from a frozen foot and was honorably discharged. When the United States entered the war he reenlisted. At the close of the war he located for practice at Portland.

Dr. John Morris, of Lewiston, Ida., died March 26, aged 76. He was born in Knoxville, Mo., in 1850. He graduated from St. Louis medical college in 1874. In 1875 he located at Mount Idaho, in Idaho county. He had an active part in the Nez Perce Indian war and after this located, in 1876, in Lewiston, where he practiced for fifty years. He was said to be the oldest member of the Masonic fraternity in Idaho, having joined a lodge fifty-three years ago. He served two years as county treasurer, and was mayor of Lewiston, 1914-15, having served prior to this as a member of the city council from 1894-98. He was health officer for six years. He took a prominent part in commercial affairs of the city and was active in the investigation of historical matters of interest.

Dr. Fred J. Fassett, of Seattle, Wash., died at Los Angeles, Calif., March 24, 1926, after a long illness following an attack of encephalitis lethargica. He was 51 years old. He was born at Rochester, Vt., in 1875. He received his preliminary education at St. Johnsbury Academy and graduated from Yale University in 1898. He received his medical degree from Harvard Medical School in 1906. After service in several Boston hospitals he located for practice in Seattle in 1907, making a specialty of orthopedic surgery. He was the first physician to follow that specialty and did pioneer work along that line. He served overseas with the British forces 1917-19, and received the British gold medal for his services. He was identified with the Children's Orthopedic hospital in Seattle and was active in its development. He was a cultured physician of the highest mental attainments and of qualities that endeared him to patients and medical acquaintances. During his long period of illness he exhibited patience and forbearance of an ideal character. His removal from the medical profession is a distinct loss to the Pacific Northwest.

Dr. J. P. Driscoll, of Spokane, Wash., died April 6, aged 44. He was found unconscious in his automobile the previous evening, having sustained a cerebral hemorrhage. He was born in Wisconsin, and graduated from the medical department of the state university. He located in Spokane ten years ago, having previously practiced for eight years at Pasco.

MEDICAL RESERVE CORPS

MOBILIZATION OF MEDICAL RESERVE UNITS, NINTH CORPS AREA

Progress in the organization of the Medical Reserve Units of the Ninth Corps Area has extended to the point where a number of them have been directed to prepare their plans for mobilization in case of emergency. In a general way, units which have three-quarters or more of their commissioned personnel, including their executive staff, have been directed to prepare their mobilization plans. The following units have already been mobilized or are preparing their plans therefor. Their figures for personnel are as of April 1, 1926. In a number of instances, steps have already been taken to enroll suitable officers for the few remaining vacancies

Unit	Home Station	Commanding Officer	Commissioned Personnel Required All Branches	Commissioned Personnel Assigned	Commissioned Vacancies	Percentage Completed
General Hospital No. 145	Billings, Montana	Awaiting assignment	42	38	4	90
Station Hospital No. 138	Portland, Oregon	Maj. Calvin S. White Portland, Oregon	13	10	3	77
Hospital Train No. 65	Corvallis, Oregon	Maj. Claude L. Armstrong Portland, Oregon	4	3	1	75
Station Hospital No. 140	Spokane, Wash.	Lt. Col. Ralph Hendricks Spokane, Wash.	13	10	3	77

The following-named reserve officers are relieved from assignment to organizations as indicated, and are assigned or attached to organizations:

Major Ralph C. Matson, Med-Res., 1021 Corbett Bldg., Portland, Oregon, is relieved from assignment to General Hospital No. 46, Communications Zone, and is assigned to the 37th Evacuation Hospital, 6th Army, as Chief of Medical Service.

First Lieutenant Alfred Henry Johnston, Med-Res., Heppner, Oregon, to 84th Evacuation Hospital, 3d Army, as Medical Ward Officer.

Major Hugh Mullarkey, Med-Res., Dixon, Montana, to Hospital Center No. 23, Convalescent Camp, Zone of the Interior, as Chief of Medical Service.

Captain Robert E. L. Hold, Med-Res., 815 Thompson St., Portland, Oregon, to 82nd Evacuation Hospital, 3d Army, as Surgical Ward Officer.

Lieutenant Colonel Frank R. Mount, Med-Res., Bank of Commerce Bldg., Oregon City, Oregon, is relieved from assignment to Hospital Center No. 23, Zone of the Interior, and assigned to 82nd Evacuation Hospital, 3d Army, as Chief of Medical Service.

The following-named Medical Reserve officers are relieved from assignment to the 104th Division and assigned to General Hospital, No. 145, Zone of the Interior, and to positions within the unit as indicated:

Captain Carl L. Koehn, Med-Res., P. O. Box 386, Red Lodge, Montana, as Medical Ward Officer.

Captain William G. Richards, Med-Res., 203 Hart-Albin Bldg., Billings, Montana, as Chief of Laboratory Service.

Captain James I. Wernham, Med-Res., 236 Hart-Albin Bldg., Billings, Montana, as Chief of Surgical Service.

First Lieutenant Robert J. Hanley, Med-Res., 223 Hart-Albin Bldg., Billings, Montana, as Medical Ward Officer.

REPORTS OF SOCIETY MEETINGS

OREGON

OREGON STATE MEDICAL SOCIETY

MINUTES OF THE FIFTY-SECOND ANNUAL MEETING OF OREGON STATE MEDICAL SOCIETY, HELD AT MULTNOMAH HOTEL, PORTLAND, ORE., APRIL 1-3, 1926.

HOUSE OF DELEGATES

Thursday, April 1.

The meeting was called to order by the President, Dr. Paul Rockey, at 11:00 a. m., in Room 105, Multnomah Hotel.

Roll call of officers and delegates was had. All officers were reported present. The following delegates were seated:

Dr. Geo. E. Vandervert, of Bend, as delegate from the Central Oregon Society.

Dr. W. W. Allen, of Mill City, as delegate from Central Willamette Society, by vote of the House.

Dr. R. J. Pilkington, of Astoria, was substituted as delegate from Clatsop County, by vote of the House.

Dr. A. B. Peacock, of Marshfield, as delegate from Coos and Curry Counties, by vote of the House.

Dr. W. P. McAdory, as delegate from Eastern Oregon Society.

Dr. James C. Hayes, as delegate from Jackson County Society, by vote of the House.

Dr. P. M. E. Carstens, of Lakeview, was substituted as delegate from Klamath and Lake County Society, by vote of the House.

Dr. S. M. Kerron, as delegate from Lane County Society. Dr. P. J. Bartle was also seated as delegate, bv vote of the House.

Dr. F. F. Thompson, of The Dalles, was substituted as delegate from Mid-Columbia Society.

Dr. E. E. Fisher, of Salem, as delegate from Polk-Yamhill-Marion Society, and Dr. H. J. Clement, was also seated by vote of the House.

Doctors C. M. Barbee, Ralph Fenton, M. K. Hall, Wilson Johnston, F. M. Brooks, Eugene Rockey, C. U. Moore, Donald Jessup, C. J. Smith and S. M. Strohecker, as delegates from Portland City and County Society. Doctors Wm. Livingstone and J. M. Murphy, also seated as delegates from City and County Society by vote of the House. Dr. Roy McDaniel was substituted for E. B. McDaniel, as delegate from City and County Society.

Dr. G. M. Gregg, of Ashland, was substituted as delegate from Southern Oregon Society by vote of the House.

Dr. David Robinson, as delegate from Tillamook County Socіey, by vote of the House.

SECRETARY'S REPORT

To the members of the House of Delegates of the Oregon State Medical Society:

I have the honor to submit the following report for the year 1925-1926.

On account of the annual session being held much earlier than usual it is necessary to report the membership of the society as of March 1, 1926. The paid up membership of the society in 1925 was 510. The present membership is 553, a substantial increase over last year. There can be no doubt that the Oregon State Medical Society is now stronger than ever. There are county societies that have lost ground but they never had much to lose.

Membership

	Number Carried	Number Paid 1926	Number Unpaid 1926	Number Paid 1925
Central Oregon	12	4	8	10
Central Willamette	10	3	7	8
Clatsop	11	7	4	10
Coos and Curry	22	10	12	19
Eastern Oregon	27	13	14	22
Jackson Co.	10	5	5	9
Klamath and Lake	17	13	4	14
Lane	28	21	7	26
Mid-Columbia	10	6	4	9
Polk, Yamhill, Marion	39	22	17	36
Southern Oregon	10	4	6	7
Tillamook	5	1	4	4
Portland City and County	352	194	158	336
Total	553	303	250	510
Associate Members	7	0	7	7
Non-Resident	3	1	2	3

Meetings of the Council

During the last year the Council has held six regular and three special meetings and has carried on the routine business of the society. The Council authorized a committee to carry on an active campaign for the reduction of the narcotic tax. The Oregon Public Health League was requested to employ an inspector for the prosecution of violations of the Medical Practice Act. The Portland City and County Medical Society was authorized to accept applications from physicians practicing in Washington County, pending the formation of a local medical society in that community.

Dr. Miles Kirkpatrick was elected to Honorary Membership on December 14, 1925.

At the December meeting a communication was received from the American Medical Association submitting a model Constitution and By-Laws for adoption by state medical societies.

A committee was appointed by the President, consisting of Otis Wight, Chairman, C. M. Barbee, Karl Martzloff, C. U. Moore, and Calvin S. White. The committee was requested to prepare a report and submit the same to the Council before the annual meeting.

This report was submitted to the Council at the March 8 meeting and was read at special meetings on March 15, 16 and 17.

The Council voted that Chapter 13 of the old By-Laws be retained in the revision.

With this revision the Council by a unanimous vote recommended to the house of delegates the adoption of the report of the committee.

The President, Dr. Rockey, stated it was his opinion that Chapter 13 of the old By-Laws should not be included in the revision.

Since the last meeting the following societies were visited: Tillamook, Marion, Central Willamette and Lane County. There is nothing that stimulates a society more than a visit from a member of the Council and the out of town physicians. A regular program of visiting societies at stated intervals would undoubtedly stimulate the weaker societies into activity.

The Councilors were assigned to the following districts:

District No.	Counties	Councilors Assigned
1	Multnomah	C. E. Sears Otis B. Wight
2	Clatsop Columbia Washington Clackamas	Hugh S. Mount
3	Polk Yamhill Marion Tillamook	C. L. Booth
4	Linn Lane Benton Lincoln Coos Douglas Curry	Wm. Kuykendall
5	Jefferson Crook Deschutes Sherman Wasco	C. J. Smith
6	Lake Josephine Jackson Klamath	R. S. Stearns
7	Harney Malheur Baker Grant	E. B. McDaniel
8	Wallowa Union Umatilla Morrow Gilliam Wheeler	L. B. Bouvey

Medical Defense Fund

The following are the expenditures of the Medical Defense Fund:

Carey & Kerr—Legal services—Lippold vs. Dr. Allen S. Kidd	$250.00
Carey & Kerr—Legal services—Beatty vs. L. O. Roberts	100.00
Carey & Kerr—Legal services—Margaret Brill vs. L. O. Roberts	150.00
Oregon State Medical Society—Charges in printing Bonds—charged to Gen. Fund	$ 48.47

The resignation of Frank S. Ward and Mrs. Sherman were accepted at the February meeting of the Council.

Mr. Ward asked to be relieved so that he could give his entire time to the Board of Pharmacy. The change taking place just before our annual meeting has made it difficult to get out the many reports that have been required of them. Mr. Thomas was employed to take Mr. Ward's place but resigned after a month's service. He made a thorough audit of the books and we are now able to give you a complete financial statement to date which checks.

FINANCIAL REPORT OF THE OREGON STATE MEDICAL SOCIETY

Statement of Receipts and Disbursements
General Fund
From July 31 to February 28, 1926

Balance on Hand July 31, 1925	$1,915.96
Balance in Petty Cash Fund July 31, 1925	5.00
Total Cash Balance July 31, 1925	$1,920 96

Receipts

Dues Collected:			
State Society Dues	$7,978.00		
Portland City and County Society Dues	1,522.00		
Mid-Columbia Society Dues	18.00		
Eastern Oregon Society Dues	17.00		
Southern Oregon Society Dues	4.00		
		$9,539.00	
Other Income:			
Interest Earned on General Fund Bonds	$ 212.50		
*Premium on Bond Turned over to Medical Defense	7.19		
Pro-rata Cost of Bonds Purchased Feb. 27, 1925	48.47		
		$ 268.16	
Total Income			$ 9,807.16
TOTAL RECEIPTS AND BALANCE			$11,732.12

Disbursements

Turnover:			
Oregon Public Health League (Pro-rate Dues)	$4,338.80		
Medical Defense Fund (Pro-rate Dues)	1,590.95		
		$5,929.75	
Refunded Dues:			
Portland City & County Society	$1,707.00		
Mid-Columbia Society	18.00		
Eastern Oregon Society	17.00		
Southern Oregon Society	4.00		
		$1,746.00	
Operating Expense:			
Office Rent	$ 96.38		
Salaries	25.00		
Telephone and Telegraph	23.99		
Printing and Multigraphing	45.99		
Postage	127.28		
Office Expense	52.03		
Miscellaneous Expense	25.75		
Executive Secretary Expense	33.42		
Office Furniture (Rugs)	34 40		
Bank Charges	2.59		
		$1,742.48	
Total Disbursements			$ 9,418.23
Balance on Hand Feb. 28, 1926			$ 2,309.89

*Liberty Bond Transferred from General Fund to Medical Defense Fund at Par Present Value $1,007.19.

MEDICAL DEFENSE FUND

Balance on Hand July 31, 1925		$ 48.29
Receipts:		
Pro-rated Dues from Society	$1,590.95	
Interest Earned on Bonds and Savings Account	201.94	
Savings Acct. Dept. in Fund	425.00	
	$2,217.89	$ 2,217.89
Total Receipts		$ 2,266.18

Disbursements:

Med. Def. Expense (Legal)	$ 500.00	
Premium on Bond, Gen. Fund	7.19	
Cost of Bonds Purchased	48.47	
	$ 555.66	
Total Disbursements		$ 555.66
Balance Med. Def. Fund Feb. 28, 1926		$ 1,710.52

BALANCE SHEET FEBRUARY 28, 1926

Assets

Current:

Cash in Bank:

General Fund	$2,309.89	
Medical Defense Fund	1,710.52	
	$4,020.41	

Bond Investments:

Liberty Bonds—General Fund	$ 4,000.00	
Libery Bonds—Med. Def. Fund	8,000.00	
	$12,000.00	

Accruals:

Accrued Interest Feb. 28 ,1926	$ 282.10	

Fixed Assets:

Office Furniture & Fixtures	$ 273.20	
Total Current and Fixed Assets		$16,575.71

Liabilities

Surplus:

Surplus to Feb. 28, 1926	$16,575.71	
Total Liabilities		$16,575.71

STATEMENT OF RECEIPTS & DISBURSEMENTS

Receipts

Since last report July 31, 1925, to March 29, 1926:

Balance in Bank July 31, 1925		$ 2,437.98
Received from O. S. M. S.	$4,338.80	
Received from Advertising	42.00	
Refund from Post Office	1.03	
Total Receipts	$4,381.83	$ 4,381.83
Total		$ 6,819.81

Disbursements

Executive Secretary, Salary	$ 1,286.50
Stenographer, Salary	897.61
Rent	109.87
Telephone and Telegraph	23.18
Office Expense, Miscellaneous	28.84
Stationery	6.29
Printing League Bulletin	75.30
Postage	15.00
Legislative Expenditures	20.98
Special Inspector to Enforce Medical Practice Act, Salary	240.00
Special Inspector's Traveling Expenses	196.10
Total Disbursements	$ 2,899.67
Balance in Bank	3,920.14
Total	$ 6,819.81

Recommendation

The business of the State Society has increased to such an extent that a full time executive secretary is an absolute need, if we are going to give the service that the members are demanding. In addition to these duties, this is a legislative year and it is essential that we have some one who will carefully scan all new legislation and advise the Society when action is necessary. Copies of all new bills relating to health should be sent to active members of the Society in every county and district. The establishing of a local legislation committee in every district is the only practical way of handling this work effectively.

Medical defense should also be given more consideration. Much money could be saved by a personal investigation of every case.

Another important function is that of coordinating all organizations interested in the prevention of disease. The president and secretary of the following organizations should form an advisory council:

Oregon State Medical Society
Oregon State Board of Medical Examiners
Oregon State Board of Health
Oregon State Board of Dental Society
Oregon State Board of Dental Examiners
Oregon State Board Pharmacentical Society
Oregon State Board of Pharmacy
Oregon State Board Nurses' Association
Oregon State Board Nurses' Examining Board
Oregon State Board Public Health Nurses' Assn.
Oregon State Board Tuberculosis Association
University of Oregon Medical Department
University of Oregon Extension Department
United States Public Health Service
American Red Cross
Child Welfare Commission
Visiting Nurses' Association
Oregon Parent-Teachers' Association.

The Society should consider also the publication of a lay journal. With the cooperation of all these agencies, it would not be a difficult thing to finance. The *Northwest Journal of Minnesota* has made the Society an attractive offer. The advertising will pay the expenses of publication and it can be distributed at fifty cents for an annual subscription. It would be sold at newstands for ten cents a copy. This magazine would reach a larger number of people than Hygeia. Hygeia is a high-grade magazine but its price is prohibitive to the masses. It is in the class of Scribner's and Harper's. What is needed is a health magazine at Saturday Evening Post prices. Minnesota has built one of the strongest state societies in this country. Over 70 per cent of the physicians of that state are members of the State Society.

A full time personnel would cost about seven thousand dollars.

Salary of an Executive Secretary	$3,600.00
Traveling Expenses	720.00
Stenographer	1,200.00
Office Rent	600.00
Miscellaneous Running Expenses	800.00
Total	$7,000.00

This can only be done on a paid-up membership of 700.

With an active secretary, the membership can easily be increased to 700. All that is necessary is for the Society to adopt a permanent policy. Plan on a five-year program and get a membership of 75 per cent of the physicians of the state. This can be done. It has been done in Minnesota by a similar program.

Minnesota—2,283—2,087 are members. About 75 per cent.

Oregon, 1,176—551 are members. About 46 per cent.

The members would receive the following benefits:

Medical Defense which, if purchased from a private company, would cost	$12.50
Legislative and Lay Activities, full time personnel	25.00
Journal Northwest Medicine	2.00
Routine State Society Activities	5.00

Respectfully submitted,

Frederick D. Stricker,
Secretary.

REPORT OF THE COUNCIL

Dr. Paul Rockey, as Chairman of the Council, made the following report:

An extensive report of the Council to the House of Delegates is not necessary, because details are included in the reports of the councilors, officers and committees.

As these reports show, the varied interests of the Society have been cared for by a considerable number of members. The thanks of the Society are due to them for their services.

The membership of this Society is not as large as it should be, considering the number of possible members, the physicians of the state. The report of the Society in influence and effort is not as great as it should be from its actual membership. The influence of the Society is less than it should be in several directions, in which the interests of the medical profession are importantly concerned. It is for the House of Delegates to consider these matters, and to effect betterments. Over any length of time the Society can appeal to the physicians of the state for membership, and to physicians and laymen for support only as it deserves. By your official actions in this meeting you determine the size, kind and influence of this Society for the coming year, and to an extent for the years immediately following. You can take pains to elect to all the offices the physicians who truly represent the profession, and who can and will perform their duties. By your action on the Constitution and By-Laws you can provide the Society with the organic machinery with which able officers and loyal members can accomplish the purposes of the profession. And in addition, by your consideration of and action on policies, you can enable the physicians of this state to do their part toward achieving the purposes of the medical profession.

The scientific program of this meeting calls for our gratitude to the committee and to the speakers. It is to be hoped that the Society will do increasingly more toward helping the component societies with their scientific work.

In commenting on the report on public health and disease prevention, it is evident that the public must consider increasingly more about prophylaxis and immunization, and that it is your opportunity and duty to offer advice and help.

In the report of the Committee on Public Policy and Legislation, your attention is invited to the dignified policy of offering expert advice to the legislature.

Constantly more will be done in influencing the laity about medical facts through publications. It is for you to consider and decide the extent and kind of this effort in the immediate future.

As the committee report will show, this Society as such exerts no direct and formal influence on hospitals. Surely it should not be long before we give our best help to hospitals, which are such a large part of our concern.

Medicolegal defense is an important protection to the physician. This Society has defended its members for several years. Still it is unfortunately true that many members do not heed the repeated announcements of the Medicolegal Defense Committee, not only in preventing malpractice suits, but in promptly reporting them, and in cooperating with the committee in the matter of insurance.

As will appear from the report of the Committee on Medical Education, the Society's relations with that greatest concern of our profession are practically inoperative. It cannot be that the whole medical profession of the state, as such, should fail to take an active part in its greatest concern.

All our profession is necessarily interested in industrial practice. The State Society is the only adequate agency, through which the medical profession of the state can deal with these important and difficult problems. Circumstances and conditions occasionally make some type of contract practice apparently reasonable, if not desirable, but no situation can justify the financial exploitation of medical practice for the benefit of commercial interests. One should consider economics and sociology, adequacy of professional care, and needs all available information and wisdom, and must remember that medical ethics represent experience and justice to all, and that in the long run the victims of contract practice are likely to be physicians, patients, the profession and the people generally. I know of no situation where the needs cannot be met in accordance with medical ethics.

The Committee on Revision of the Constitution and By-Laws will present its detailed report. There is one important part of that report about which I must speak, that is, the Public Health League. What I have to say, as I have said before, is said impersonally and appreciatively. The report of the Committee on Revision, as prepared, left out the League. It thus proposed a single, complete, logical state medical society, enabled to fix the amount of its dues and to expend them. It could still, if the membership of the Society so desired, finance the Public Health League or any other organization that could justify itself to the Council of this Society. No amount of enthusiasm for the purposes of a public health league can compensate for the fact that it is bad policy to maintain an additional and separate interest in the Society, and that it is wrong to forcibly finance such an organization over the expenditures, actions and policies, of which the representatives and officers of the State Medical Society have no control.

On motion duly made, seconded and carried, reading of the minutes of the last meeting of the Society was dispensed with, having been printed in Northwest Medicine.

PUBLIC HEALTH LEAGUE

Dr. C. J. Smith, as Chairman of the Executive Committee of the League, gave a report showing the activities of the League from a political standpoint, as follows:

In reporting the activities and work of the League for the Conservation of Public Health during the past year, you may be interested in a partial review with which most of you are quite familiar. As you know, it is necessary in this day and age, with the tendencies toward commercialism of the healing art, and especially the so-called "irregulars," that occasionally some political influence, either directly for meritorious measures or in opposition to irregular medicine, be asserted. As a consequence the medical profession, being highly technical and professional, is always loath to undertake anything that will involve it in any way, so-called politically, and therefore it has been deemed best to divorce the political activities of the medical profession from that of the scientific work, and for this particular purpose the League for the Conservation of the Public Health was created.

In other words, its influence cannot be measured in words, and, the way in which it is organized, the politicians of the country are now perfectly willing to listen to them, whereas as a medical society pure and simple, dealing with highly technical and scientific problems, politicians and laymen simply scoffed at their activities.

By correlation of allied organizations the scope and influence of the League is tremendously broadening and made more influential every day. The political records of the acts and activities of various politicians and legislators of the State of Oregon, which have been gathered by the League during the past few years, is such as to enable the League to support in a political way those who favor public health measures, and, when necessary, to vigorously oppose those who by their own past records are adverse to matters which are beneficial to the public health.

Since the existence of this League, which dates back to 1920, there have been no bills passed by the Oregon Legislature adverse to scientific medicine or to the public health, nor have any measures been passed by initiative and referendum during this time. All of the existing adverse laws and cult bills which we have on our statutes at the present time were passed prior to the existence of the League and are the results of that always feeble effort to combat on the part of the Medical Society.

The League of the State of Oregon succeeded in getting the members of Congress, which includes three members of the House and two of the Senate, to reduce the narcotic registration fee from $3.00 per year to $1.00 per year. We also endeavored to get some changes in the method of computing the income tax on the part of the professional people, especially the allowance to be made in the way of deductions for attendance at medical societies and for postgraduate work. In this, so far, we have not succeeded but by our efforts we are sowing the proper seed which will finally germinate.

The first "kick-off" for the League after its creation in 1920 was an antivaccination bill put up to the people in the fall election. Through the efforts of the League we succeeded in getting the hearty cooperation of various clubs, associations, life insurance organizations, etc., and this referendum was defeated in the general election.

The League was organized in December, 1920, just prior to the meeting of the legislature in January, 1921. At this session five pernicious bills were introduced and backed by a very strong lobby. First, a similar antivaccination bill was introduced and defeated. Second, a Latin prescription bill was introduced, whereby all prescriptions written by doctors must be written in plain English, in triplicate, and must contain a statement of the disease, ailment, deformity or informity for which it is given. The physician was required to retain one copy, giving two to the patient—one for his own files and the other for the druggist. Third, the chiropractors brought in a bill to give them the same legal standing as physicians licensed under any other laws of the State of Oregon. This bill gave them the same legal standing as physicians licensed under any other laws of the State of Oregon. It gave them the same status as a regular medical doctor insofar as contagious diseases, birth and death certificates and other matters were concerned. Fourth, another bill was introduced creating a Board of Drugless Examiners, which was really for the benefit of the so-called naturopaths, giving them the same standing as any medical doctor insofar as treatment and report of contagious diseases, birth and death certificates, etc., were concerned. Fifth, a chiropody bill was introduced which let down the bars for this so-called branch of the medical art, although not to so great an extent as the two preceding proposed measures. The Oregon League for Public Health elicited the aid and support of various organizations interested in public-spirited matters, and all of these bills were defeated, although in some instances not without a hard fight.

Two years later, when the legislature convened again, in 1923, the cults again came forward with another bill providing for a constitutional amendment in regard to the inalienable right of a person to employ the physician of her or his choice, etc., which really amounted to an antivaccination bill. Under a different cloak a bill was also introduced which would let down the bars to various cults, whereby they could practice as any medical man, namely, a bill to provide for the taxation of any and all hospitals unless they could open their doors to any licensed doctor, regardless of his ability.

Another bill was brought in by the so-called naturopaths, which was very broad and sweeping, giving them a Board of Examiners and practically all the rights and prerogatives of a medical doctor excepting surgery. The lobby for this bill was very strong, and the catalogs of a Portland college of naturopathy were brought in evidence of the qualifications of a naturopath. Investigation of this college revealed its sham. Thorough investigation was made of this naturopathy college, so that when the case was argued before the Senate Reference Committee, and the attorney for the naturopaths stated he would pit these naturopathy doctors against any of the medical doctors assembled on the outside of the room, permission was secured for the speaker to question them. An acknowledgment was reluctantly secured from the Dean of the College that it was located in his own office, occupied jointly by himself and another naturopath, and consisted of two rooms of about ten by fifteen feet in size. He acknowledged that he, himself, was professor of anatomy, physiology, chemistry, pathology and, in fact, of all the other long lists of subjects, evidently copied from some medical school catalog, with the exception of some two or three subjects taught by his partner. When asked for the name of the textbook used in anatomy, the dean answered "Gray's Anatomy." When asked for the names of the textbooks on all the other subjects individually he was not able to recollect, even with the aid of his assistant, the name of a single textbook on pathology, physiology, or any other of the subjects mentioned in the big curriculum of his four years course college. The fallacy was very obvious, but yet the lobby was so strong they finally got it put to a vote on the floor of the Senate where it was defeated by a heavy vote.

Another bill was introduced by the osteopaths which, to epitomize briefly, gave them rights to do general surgery, and the right to practice in any public hospital in the state, having the same privileges as those holding a license issued by any other Board of Examiners which, of course, meant the Board of Medical Examiners.

Last year, at the third session of the legislature since the organization of the Oregon League for Public Health, but few bills were introduced on these subjects, and they were easily defeated. The naturopaths made a final effort, following their defeat in the legislature of 1923, to get their bill over by initiative and referendum before the people in a general election. The publicity and the cooperation necessary to defeat this before the people was successfully managed by the League and, in the opinion of the speaker, this could not have been done had the League been managed as a strictly medical organization. This opinion is concurred in by most of those who have been most active in this legislative work, and is opposed by some whose proclivities are iconoclastic and whose activities in legislative matters have been more somnolent than energetic in character.

As a consequence the work of the League stands for itself, and we sincerely hope the members of the State Society are well pleased with their investment, and that instead of looking upon the matter in a lukewarm way, each and every member will be at the 1927 session of the Oregon State Medical Society and especially after the meeting of the next Legislature, become active and enthusiastic boosters for the Oregon League for the Conservation of the Public Health.

REPORT OF SPECIAL INSPECTOR EMPLOYED BY THE OREGON PUBLIC HEALTH LEAGUE

Case 1. Dr. Y. T. Lamm, of the Chan-Lam Chinese Medicine Company, was arrested on December 30 for the sale of poisons for the treatment of venereal disease. The case was tried January 15, the jury bringing in a verdict of not guilty. Lam testified on the witness stand that he gave the medicine to the patient instead of it being a cash sale.

Case. 2. O. J. Coffman, naturopath. Coffman was arrested January 18, charged with practicing medicine without a license. He forfeited his bail and I am advised by the Post Office Department that he is now located in Oakland, Calif. His office, at 250 Second Street, has been vacated.

Case. 3. F. K. Hecker, naturopath. Arrested January 16, charged with practicing medicine without a license. He appeared before Judge Dich, pleaded guilty and paid a fine of $50.00. His office is located in the Times Building, this city. As soon as possible I will follow up the case and, if he is still practicing, will bring another charge against him as soon as the evidence can be secured.

Case 4. George Kirkpatrick, 1060 East Stark St., chiropractor. Arrested January 22, charged with practicing without a license. Kirkpatrick's practice, as you know, is principally confined to treating tuberculous cases. The case is still pending in the courts. I called at the office of the district attorney March 26 and took the matter up with him as to why we could not get this case to trial. He (the district attorney) informed me that this month's calender had been so congested that it was absolutely impossible to try it. He assured me that it would go on the first of the April calender.

Case 5. Joseph Smith, naturopath. He was arrested January 22, charged with practicing medicine without a license. The case was tried February 11 the jury bringing in a verdict of not guilty. There was plenty of evidence in my opinion to convict Smith. The jury did not seem to look at it that way.

Case 6. Anna Druger. Complaint filed January 31, charged with practicing medicine without a license. The case is still pending. I also took this case up with the district attorney with the same results as that of Dr. Kirkpatrick.

Case 7. B. A. Malin. Complaint was filed January 31, charge, practicing chiropractic without a license. He was tried February 15, found guilty, fined $200.00. Malin is a licensed chiropodist. He also holds himself out as a naturopath, diagnoses cases for his patients and treats them by an electrical apparatus and massage, but there was no evidence of his practicing medicine. Still I considered a man of his education and qualifications a detriment to public health and the only violation was that of practicing chiropractic without a license.

Case 8. Dr. Holgate, Newport. Holgate was reported by W. S. Thurtell, M. D., also of Newport, as practicing medicine without a license. I investigated the case and found the names of patients he had treated by prescribing medicine. After securing this I went to his house and had a talk with him. As Dr. Thurtell had requested that Holgate not be prosecuted and fined, I took Holgate before Judge Black and told him the story of his (Holgate's) operations. Although there was no complaint filed, Holgate pleaded guilty and was given a severe grilling by the judge, who told him that if he ever came before him again he would fine him the limit. Holgate promised to discontinue his practices.

In addition to the above cases there is a grand jury investigation being made against J. C. Ritter, naturopath, located in the Dekum Building. This case was reported to the office by Dr. Elsworth on March 3. The information I received was to the effect that Ritter had performed an abortion upon a woman by the name of Hazel Schmidt, who passed away at the Good Samaritan Hospital on February 21. I proceeded to investigate the case and secured sufficient evidence through Dr. E. V. Morrow and the hospital internes and nurses to satisfy the district attorney's office that it was a case for the grand jury to hear. All of the evidence had been submitted to the grand jury except the testimony of one witness. This witness will be called March 29.

In addition to the above prosecutions I have called on 96 physicians, located approximately in fifteen different towns outside of the City of Portland, taking up with them matters of interest to the State Medical Society and Public Health League. In a number of cases I have found it to be the disposition of some of the doctors that they would withdraw their membership from the State Society for different reasons, the principal one being that the $20.00 fee was too high, compared to the amount of benefit derived from their membership. The reports on file in the office show that seven of the doctors who were behind with their dues promised to pay up and be reinstated, and that twenty-five of the doctors who were members of the component societies but not members of the State Society promised to remit their state society dues. On my trip over the state I also have called upon forty members who are members of the State Society in good standing.

C. A. Morrow.

The report of the Treasurer, J. Earl Else, was read and filed.

REPORTS OF INDIVIDUAL COUNCILORS

Dr. E. B. McDaniel: My territory covers a large area, and is scattered so that the local society can not reach members.

Dr. Otis B. Wight: I have no report.

Dr. R. S. Stearns: I have no report to make further than to say that the medical society in Ashland and Medford is in a flourishing condition. Outside of that I have nothing to say.

Dr. Hugh S. Mount: In Clackamas county most of the men have joined the State Society. Washington county has come into the City and County Society of Portland. The other members of the Society down the river are progressing nicely.

Dr. C. J. Smith: Like Dr. McDaniel, the counties that have been assigned to me are sparsely settled and have not many medical practitioners. However, the country is very well served and they have no real cause for complaint, either the members of the profession or the people themselves. I have been unable to make a visit but have talked with a number of people and conditions are good.

Dr. Wm. Kuykendall: I attended the meeting of the society in Coos and Curry county. Had a very pleasant meeting with the boys. We are very largely paid up. No other society is more nearly paid up than that of Coos and Curry. Douglas county I have not visited but heard a very good report from them. Benton, Linn and Lane have been very well covered. They make a favorable showing.

Dr. C. E. Sears: Not present.

Dr. L. B. Bouvy: I submit my report of District Number Eight, which includes the counties of Gilliam, Morrow, Umatilla, Union, Wallowa and Wheeler.

I have either written or personally spoken to each licensed physician in this district who is not a member, advising them of the benefits and privileges to be gained by membership in the Oregon State Medical Society. An application blank and a stamped return envelope was included in each letter and the members who did not seem desirous of affiliation were asked to state their reasons for not joining.

Attached herewith is a list of the names and a few remarks which explain the physicians' attitude toward the present State Medical Society.

Dr. C. L. Booth: Councilor's report for the County Societies of Polk-Marion-Yamhill and Tillamook.

One meeting was held with the Tillamook Society, at Tillamook in January, 1926, at which practically all of the doctors were present. I was unable to be present, but the State Society was represented by Dr. Stricker and Mr. Ward, who reported that the Tillamook Society was functioning and holding regular meetings.

A meeting of the Polk-Marion-Yamhill Society was held at Salem January 19. This meeting was featured by a dinner at the Greybelle, at which an interesting program was presented and the election of officers was held. A number of officers from the State Society, including President-elect W. B. Morse, were present and gave very helpful talks.

Those who were present at the annual meeting of this society a year ago could not help but feel encouraged over the increased interest manifested at this meeting and all present united in pledging Dr. Morse their complete cooperation and support for the coming year.

To summarize, therefore, I beg leave to report that insofar as the above counties are concerned they are in a very healthy condition.

REPORTS OF COMMITTEES

Reports of Committees then being in order, the Chairman called for reports as follows:

Report of Program Committee: Dr. Stricker, chairman, placed the printed report before the House, which was filed.

Report of Committee on Public Health and Disease Prevention

So short has been the time since the appointment of your committee on Public Health and Disease Prevention and the early date of this meeting, that our report will have to deal largely with the year 1925 and project itself into 1926 by way of what seems to your committee vital suggestions to be taken up at this meeting and carried on as a definite program in public health and disease prevention.

The year 1925 was a fortunate year for the State of Oregon, in that there were no unusual outbreaks of contagious diseases; the same condition maintains thus far in 1926. But, on the other hand, the usual run of contagious diseases is far too high; particularly is this true in the list of the preventable diseases. The economic waste to the people of the state through this channel is far too high. Improvement in this condition is strictly a duty of the medical profession.

During the year 1924 and 1925 there were:

Contagious Diseases

	1924		1925	
	Cases	Deaths	Cases	Deaths
Tuberculosis	759	568	843	537
Typhoid	215	49	263	32
Whooping cough	232	15	851	59
Diphtheria	1404	107	1370	101
Measles	5255	82	190	0
Scarlet fever	1109	17	1408	18
Smallpox	831	3	863	2
Chickenpox	948	0	1123	0
Mumps	236	0	1090	3
Influenza	47	121	1602	196
Pneumonia	73	654	391	610

Thus far in 1926 during the months of January and February:

	January		February	
	Cases	Deaths	Cases	Deaths
Diphtheria	111	8	90	5
Smallpox	313	2	186	1
Scarlet fever	227	1	179	2

In Portland there are two hospital associations that have members of their associations scattered throughout the timber industry of both Washington and Oregon. During the past six months there have been cases where illness has arisen in camps in the state of Washington, and after determining that the cases did not come under suitable accident regulations, they were given transportation into the city of Portland and turned loose without care. A few cases of epidemic cerebral meningitis and of smallpox were thus, in violation of interstate commerce and federal regulations, sent from the state of Washington into Oregon, where they had to be cared for by our public health authorities. In addition to being a violation of constituted regulations, this at once is a definite menace to the public health.

The presence at this time of a larger number of cases of smallpox of a light form in Oregon than usual, and the presence of the disease in the hemorrhagic form in both California and Washington, demands that the profession use every possible means to safeguard the public. In every way possible vaccination should be insisted upon.

One of the most vital public health laws ever enacted in this state is the Eugenics Law. The wisdom of its provisions has been so thoroughly proven within our state institutions that the Board of Eugenics feel that the profession at large should thoroughly post themselves on its provisions and applications. Its economic value to the state is a matter of public record open to all; its value to the public in protection to our future citizens cannot be computed in dollars; its humanitarianism cannot be questioned; and we are sure that all are agreed that whatever tends to raise the standard of human intelligence and efficiency is of prime importance as a public health measure. We place this law among the far-reaching advanced steps in public health and disease prevention. Its faithful carrying out will lessen feeblemindedness, decrease degeneracy and criminality and raise the standard of our citizenship.

With a State Board of Health fully awake to the situation and doing all it can do with its limited funds to cope with it, with five full time county units all functioning admirably, with able county and city health officers and various other health organizations, there no longer exists a plausible reason for as many cases of preventable diseases, particularly of typhoid, diphtheria, scarlet fever and smallpox. Your committee wishes to urge that a strong stand be taken at this meeting of the Oregon State Medical Society on immunization against these four diseases, and an advanced stand in preventive medicine in general.

The society at the last annual meeting went on record opposing a skyline road being built along the Cascade Range. Other organizations are likewise interesting themselves in opposing this development. If the watershed of the Cascades is to be kept free of this contamination menace, the time for concerted action has arrived. Likewise the general subject of of stream pollution should receive attention. The State Board of Health has added to its staff a competent sanitary engineer who will be of great value to the profession at large in meeting this ever present menace.

The auto camps of the state, while under the direct supervision of the State Board of Health, may at any time become a fruitful source of communicable diseases. Therefore, your committee would urge that the profession at large be on the alert and ready to assist in safeguarding these camps. There are a large number of industrial camps, employing large forces of laborers, scattered over various sections of the state during the different harvest seasons, such as farm crops, hop picking, strawberry picking and apple picking. Your committee would urge the same recommendation, that the profession should be on the alert and ready to assist in safeguarding these temporary camps.

Respectfully submitted:
John G. Abele
H. R. Cliff
R. W. Hendershott
Geo. E. Hauck
C. M. Barbee, *Chairman.*

Report of Committee on Public Health and Disease Prevention read by Dr. C. M. Barbee, and filed.

Motion was made, seconded and carried that this report be given to the press.

Motion made, seconded and carried that the meeting adjourn pending luncheon and to continue the meeting through luncheon.

Meeting called to order by the President in Tea Garden Room of the Multnomah Hotel, and continued as follows:

Announcement of the Entertainment Committee of its program for entertainment during the session.

Report of Committee on Public Health and Legislation

The following matters are submitted to the House of Delegates.

Questions relating to the scope and functions of the Public Health League:

A. The desirability of a coordinating agency, whereby medical men may exercise some advisory influence in assisting the operations of such bodies as the Visiting Nurses Association, Tuberculosis Association, Parent-Teachers Association has long been recognized, but the committee calls attention to the difficulty of reconciling the personal interests of the proponents of each of these methods of health education.

Questions of continuing membership in the executive committee of the League, of the employment of a permanent secretary, and of changes in the amount of distribution of dues are constitutional and should be brought before the society with recommendations from the House of Delegates.

B. No change in the existing Oregon code of medical legislation is suggested. The committee recommends that the Council scrutinize the record of candidates for the legislature, and that following election of members, and also upon convening of the legislature, a letter be sent to each member and to the President of the Senate, and the Speaker of the House, drawing attention to the fact that the Medical Society is not proposing any legislation, but that through its President and Council it will be glad to furnish advice relative to any matters touching the public health or to the practice of the healing art, or enactments pertaining thereto.

C. The committee recommends a protest directed to the members of the Oregon Delegation in Congress, against continued invasion of state rights and privileges in medical matters, as follows:

1. Against continuance of the Federal mother's aid bill, except in backward communities incapable of self-help.

2. Against the hospitalization and treatment of veterans of all wars by the Federal government, whether their ailments be due to war disability or not.

3. Against cooperative Federal public health activities, except for the most sparsely settled communities.

4. In principle, opposing federalization and preferring independent action and local control by state boards.

D. The committee suggests two methods of popularizing periodic health examinations:

1. Demonstrations of routine technic before medical societies.

2. Indorsing the work of the Gorgas Memorial, which includes radio broadcasting and newspaper articles carefully edited and sent out systematically from headquarters which are informed about conditions all over the country.

E. The committee is favorable to the publication of a health journal for lay circulation, provided high quality of material can be secured. Possible circulation in so small a state being limited, the committee is disposed to recommend the encouragement of club subscriptions to "Hygeia" at reduced rates to be ascertained.

Respectfully submitted:
A. W. Baird
William House
Wilson Johnston
Calvin S. White
Ralph A. Fenton, *Chairman.*

Report of Committee on Publication

In the absence from the city of Dr. House, the chairman of the Publications Committee, we, the remaining members of the committee, have prepared and present you the following as our report:

There was some question as to the exact functions of this committee. It was decided that its duties consisted in getting to the public through various publications knowledge of medical subjects so as to properly place the medical profession before that public, and so that the public may properly evaluate the medical profession.

The committee believes that Hygeia, the health publication of the American Medical Association, should be given every possible support and its circulation increased by every means possible. Regarding the publication of a smaller journal in the name of the Oregon State Medical Association, the committee is not ready to give a definite opinion. The committee believes that its main efforts should be in the direction of the publication in the newspapers throughout the state of short news items, bearing on various phases of medical subjects. These items being news would be published by the press without cost to this society.

A few weeks ago, through the efforts of one of the members of this committee, an article appeared on the first page of the Oregonian, stating that seventy-five physicians of Portland, members of the City and County Medical Society, had been vaccinated against smallpox the previous evening. This statement of fact as news probably protected more people from smallpox than pages of paid advertising could have done. It is this type of articles that your committee has in mind. The cost of getting these out would be very small, as the newspapers would publish the news items that our news writer would prepare. Your committee would safeguard the items by not allowing the publication of any article until it had been approved by the committee. The estimated costs of an average of two items each week in each of the four Portland papers and the syndicating of some of these throughout the state would be approximately three hundred and fifty dollars a year.

We believe that the public has the right to know what the medical profession is doing; that they have the right to know what the University of Oregon Medical School is doing; that they have the right to know what the health agencies of the state, counties and cities are doing; that they have the right to know when the hospitals have anything of public interest, and we believe that the medical profession has the right to have the misconception as to its secretiveness corrected.

When the medical profession goes before the legislature, favoring a bill for the benefit of public health or disapproving one opposed to the best interests of the public, they should appear before men who are in a receptive mood through having been educated, perhaps unconsciously, during the previous twelve months by such items as have just been mentioned. When the public, and the law makers especially, really understand the viewpoint of the medical profession the matter of securing proper legislation, adequate appropriations and so on are practically solved and the work of the various health bodies will be carried forward on the wave of enthusiasm engendered by this publicity.

Respectfully submitted:

T. HOMER COFFEN
A. G. BETTMAN
By A. B. BETTMAN,
Acting Chairman.

REPORT OF COMMITTEE ON HOSPITAL BETTERMENT

The Hospital Betterment Committee has held no meetings the last year. There has been no recognized necessity for calling the committee together.

W. B. HOLDEN, *Chairman.*

REPORT OF BOARD OF JOURNAL TRUSTEES

As you are aware, NORTHWEST MEDICINE, published in Seattle, is the official medical journal of the State Medical Association of Oregon, Washington, Idaho and Montana, and as such is managed by three trustees from each state, who elect the editor and manager of this journal.

By way of history, and which, by the way, is a "gentleman's agreement," it was conceded some years ago between the members of the profession of the states of Oregon, Washington and Idaho that, so long as the Oregon State University maintained a medical school and an A class school at that, the Washington State University would not put in a medical department leading to a degree. By way of concession, the Oregon profession agreed not to maintain as its official journal one published in the state but that NORTHWEST MEDICINE, published in Seattle, should be the official publication of this society. Utah was added to the states and has since lost to California, but Montana has been added and is now one of the four states recognizing Northwest Medicine as its official publication.

As members of the Board of Trustees from the state of Oregon, we would recommend to the profession of this state that they use every honorable means to bring British Columbia into the organization to recognize NORTHWEST MEDICINE as its official publication. Oregon was the first state to raise the subscription per member for the journal from $1.00 to $2.00 and, as we understand, the other states have followed. Now we have a journal very well maintained through contributions of $2.00 per member from the membership of the four states and in addition thereto the advertising is a source of considerable revenue.

This committee for the state of Oregon, together with the management of the journal, solicits suggestions as to its betterment and, if possible, to make it a more useful factor to the profession which it serves.

Respectfully submitted:

C. J. SMITH
R. C. COFFEY
E. B. PICKEL.

REPORT OF COMMITTEE ON MEDICOLEGAL DEFENSE

The following cases were disposed of during the year 1925, in which Carey and Kerr have appeared for the Oregon State Medical Society:

Louise Carrico vs. Dr. Vernon J. Brown. Circuit Court for Multnomah County. This was an action for $51,194.60 and was brought on the claim that Dr. Brown was guilty of malpractice in neglecting the treatment of a fractured leg, resulting in the loss of the leg. The case went to the jury but resulted in a verdict by the jury in favor of Dr. Brown.

Donald C. Parker vs. Harvey G. Parker. Circuit Court for Multnomah County. This was an action for $12,000 on a claim that Dr. Parker had been guilty of malpractice in treating a case of acne. The case was tried before Judge Tucker with a jury, resulting in a judgment of nonsuit at the end of plaintiff's testimony, on the ground that no evidence of malpractice had been produced.

Ocie A. Wells vs. Frederick E. Diemer. Circuit Court for Multnomah County. This was an action for $10,150, based on the claim that the defendant had been guilty of malpractice in the use of x-ray treatments. The case was tried before Judge Skipworth and a jury, and resulted in a judgment of nonsuit at the end of plaintiff's case, on the ground that no evidence of malpractice had been produced.

Lippold, F. J., vs. Dr. Allen S. Kidd. Circuit Court for Multnomah County. This was an action for $50,532.75 on account of claim of malpractice in the treatment of plaintiff's left eye, resulting in the loss of the eye. The case was tried, resulting in a verdict for the plaintiff for $5000. It is now on appeal to the Supreme Court.

John L. Erickson vs. Dr. Fred Ziegler. Circuit Court for Multnomah County. This was an action for alleged malpractice in setting the bones of plaintiff's left leg and was brought for $21,560.00. Settlement had been made through attorney's office between plaintiff and automobile driver who caused the injury. When the malpractice case was brought against Dr. Ziegler, an answer was filed denying malpractice and also setting up the settlement which had been made by the automobile driver with plaintiff which had included the final injury of the plaintiff which he claimed was aggravated by the malpractice. The court held that our answer stated a good defense and the case was thereafter dismissed by the plaintiff.

W. H. Beatty vs. Dr. L. O. Roberts. Circuit Court for Multnomah County. This was an action for $15,000, brought on the claim that the doctor was guilty of malpractice because of his giving plaintiff a hyperdermic injection prior to removing plaintiff's tonsils and telling him to wait on the front porch until he was ready. It was claimed that plaintiff was overcome by the injection and fell off the porch and injured his neck. The trial court refused to grant a nonsuit or directed verdict and the case was submitted to a jury, resulting in a verdict for the doctor.

Evelyn Clendening vs. Ralph C. Walker, Willis W. Vinson and Louis K. Poyntz. Circuit Court for Multnomah County. This action was for $100,000 on account of radium and radium treatment in removing a tumor. Testimony of Drs. Walker and Poyntz was taken by the plaintiff on deposition and the case was set for trial but before trial the insurance company made a settlement and the case was dismissed.

Margaret Brill vs. L. O. Roberts. Circuit Court for Multnomah County. Action was for $20,000 on account of alleged malpractice in tonsil operation. The case came on for trial and resulted in a judgment of nonsuit dismissing plaintiff's action.

Cases Pending on March 1, 1926

Minnie M. Doumitt vs. Frederick D. Diemer, Frank E. Butler and others. Circuit Court for Multnomah County. This action was brought for $25,595 growing out of x-ray treatments. No trial date has been fixed.

Nellie Runyan vs. Dr. A. H. Johnston. Circuit Court for Morrow County. Action for $25,000 on account of tonsil and adenoid operation. Our last report from the attorneys representing the doctor personally was that they had demurred to the complaint on the ground that the action had not been brought on time. We furnished the attorneys for the doctor with a list of authorities and have had no advice from them as to a decision of the court.

Hugh Holland vs. Dr. W. B. Neal, M. G. Howard and Eugene Hospital. Circuit Court for Lane County. Action is for $15,000 on account of claim of malpractice in setting plaintiff's right femur. The case stands on certain preliminary motions and no trial date has been fixed.

N. E. Hievly vs. Dr. A. K. Higgs. This case is now pending in the Supreme Court and is on appeal by Dr. Higgs.

F. J. Lippold vs. Dr. Allen S. Kidd. This case is now pending in the Supreme Court on appeal by Dr. Kidd.

Respectfully submitted:

A. E. Mackay, *Chairman.*
E. J. Labbe
Augustus Bailey.

Committee on Medical Education had no report to make.

Committee on Cancer Control had no report to make.

Report of Committee on State Industrial Accident Commission

There have been a number of complaints entered with the Committee on the physicians' fees paid by the State compensation. The Committee on going into this matter feels that it would not be proper at this time to ask for a revision of the fee schedule. We feel that some of the fees should be revised but on the whole the physicians are paid a rate higher than they would receive from the same class of work in private practice.

The committee feels that the Medical Society should take some action regarding the State Accident Commission subcontracting the work to private physicians and hospital associations. This is a deplorable condition and very hard to find a remedy for the same. Under the present system the State Commission in a number of instances subcontracts the work to hospital associations and they make their own fees and as a consequence the doctors are doing the work from fifty to seventy-five per cent less than the schedule as allowed by the Accident Commission. If this matter could be taken up with the State Accident Commission and have them discontinue subcontracting the work to hospital associations and private doctors, it would be more equitable and satisfactory, not only to the physicians but also the employees. Under the present condition the physicians are at the mercy of the hospital associations.

The committee also recommends that the Commission be requested that when any patient is reexamined by the Commission at its office, the doctor formerly in charge of the case should be notified of the date of such an examination and be invited to be present, if he so desires. Under the present system the Commission orders the patient up for examination unbeknown to the physician in charge and, if they deem it necessary, transfer this patient into their hands, regardless of the qualifications or ability of the physician in charge to handle such a case.

We respectfully submit these recommendations for your consideration.

Joseph F. Wood, *Chairman.*
Herbert Nichols
Stuart Sheldon.

Supplemental Report

In the industrial districts of this state hospital associations have the contract for most of the industrial work and the physicians in the industrial areas are largely at the mercy of these associations.

There are two hospital associations operating in this district. One of them requires that all fractures and injuries of any consequence be referred to their home office for treatment and that all cases needing x-rays also be referred to their office. For the emergency work that we are allowed to render, we are paid at approximately one-third less than the regular schedule of the Oregon State Industrial Accident fee bill. This association was operating here when the Oregon Workmen's Compensation Law went into effect and they have never paid the physicians for the emergency work that was allowed to be done for them more than approximately 66 per cent of the Oregon Industrial Accident Commission fee bill.

The second hospital association entered this territory some years ago and for a time paid the same for accidents as the regular State Industrial Accident fee bill. They allowed all cases to be cared for by the local physicians, if the patients so desired, and they allowed all x-ray work to be done here. Some two years ago they changed their name, changed managers, reduced fee bill to only 75 per cent or even less than that of the regular Industrial Accident Commission fee bill and have otherwise adopted many of the rules and regulations of the older association, and apparently they will have all the rules of the older association in force very soon. We are reliably informed that these hospital associations only pay the hospitals of Portland $12.00 a week for the care of hospital cases covered by their contracts instead of $18.00 a week, as' is paid by the State Industrial Accident Commission.

This deplorable condition can be remedied by requiring all hospital associations to pay the same as the State Industrial Accident Commission fee bill, and also require them to allow the men to go to any reputable physician. Or, what would be better, is to take the accident work away from the hospital associations and place it directly under the State Industrial Accident Commission. We have found that the most satisfactory way of handling accident cases is direct with the state commission.

If the accidents were all left with the State Industrial Accident Commission and not subcontracted to any hospital association, we would still be at the mercy of the associations, for illness of industrial workers and the fee bill paid us for illness by the hospital associations is even worse than that paid for accidents, but, so far as we can see, there is at present no better way of handling illnesses than through the hospital associations.

Respectfully submitted for your consideration.

Joseph F. Wood, *Chairman.*
Herbert Nichols
Stuart Sheldon

REPORT OF COMMITTEE ON MILITARY AFFAIRS

The Military Committee of the State Medical Society has endeavored to assist in the enrolling of reserve medical officers for the units allocated to Oregon, according to the requirements of the National Defense Act.

Oregon's quota is 191 officers, and on January 31, 1926, there were enrolled 150 officers or 78.53 per cent of the total required. The state of Washington has 58.1 per cent enrolled, while California has 47.14 per cent.

While Oregon is well along with her enrollment, the committee is anxious to have the quota completed and has provided literature and blanks for additional enrollments.

Besides Oregon's quota for the 98th Division, there are other reserve units to be filled wholly from Oregon. There are

To Portland:
- General Hospital (46)
- Evacuation Hospitals (82, 83, 84, 87)
- Station Hospitals (138, 143, 148)
- Surgical Hospital (70)
- Hospital Train (69)
- Hospital Companies (349th Med. Rgt.).

To Salem:
- General Hospital (139)

To Corvallis:
- Hospital Train (65)
- Veterinary Station Hospital (29)
- Veterinary General Hospital (56)

These units require all kinds of specialists as well as general practitioners.

Enrollment in the Medical Reserve Corps of the army places no obligation on the doctor and requires no effort on his part, although he may be as active in the work as he desires. The committee maintains a booth at this meeting for the purpose of giving information concerning the Reserve Corps and the enrolling of additional officers.

Respectfully submitted:

Herbert M. Greene
M. B. Marcellus
Frank Mount
Spiro Sargentich

Report of the Committee on Revision of Constitution and By-Laws, on motion duly made, seconded and carried, was laid on the table.

Committee on Automobile Liability Insurance had no report to make.

Report of Committee on Honorary Membership was read by Dr. Stricker and referred back to the House of Delegates.

Report of Committee on Necrology was read by Dr. Allen Welch Smith. On report of members, the names of Drs. W. C. Hawk and Harold Edwards Bates were added to the list of deceased members of the profession and the report filed. Motion was duly made, seconded and carried that silent prayer be extended for deceased members.

Motion was made, seconded and carried that time be given at afternoon session to eulogies of deceased members.

Appointment of Committees: The Auditing Committee, composed of Drs. C. E. Sears, C. J. Smith and Otis B. Wight, was reappointed as such for the ensuing year.

NOMINATION OF OFFICERS

Committee on Nominations: On motion duly made, seconded and carried, the House of Delegates resolved itself into a committee as of the whole, and nominated the following officers for the ensuing year:

President: Dr. Hugh Mount.
First Vice-President: Dr. Lee Bouvy.
Second Vice-President: Dr. John Sifton.
Third Vice-President: Dr. A. B. Peacock.
Secretary: Dr. Frederick D. Stricker.
Treasurer: Dr. J. Earl Else.
Three members of the Council: Dr. E. B. McDaniel, Dr. Otis B. Wight and Dr. R. S. Stearns.

On motion duly made, seconded and carried, invitation to meet at Salem next year was accepted.

On motion duly made, seconded and carried, Senate Bill 2320 was adopted by the House.

On motion duly made, seconded and carried, the meeting was adjourned until 11:00 a. m. April 2.

SECOND SESSION

Friday, April 2, 11 a. m.

The second meeting of House of Delegates was called to order by the President, Dr. Paul Rockey, at 11:00 o'clock a. m., April 2, in Room 105, Multnomah Hotel.

Roll call of officers and delegates was by motion dispensed with.

The minutes of the meeting of April 1 were read and approved.

The names Otis B. Wight and R. S. Stearns, having been withdrawn as nominees for election as Councilors, Wilson Johnston, of Portland, and Dr. E. E. Fisher, of Salem, were nominated.

The Secretary reported that the Council approved of the election of the following members to Honorary Membership: Drs. Milo Kirkpatrick, P. A. Cathey and W. H. Flanagan.

On motion duly made, seconded and carried, Dr. J. A. Fulton's name was added to the list for honorary membership.

Motion was then duly made, seconded and carried, that Drs. Milo Kirkpatrick, P. A. Cathey, W. H. Flanagan and J. A. Fulton be elected to honorary membership in the Society.

Motion was made, seconded and carried, that election of officers be deferred until 2:00 o'clock of the afternoon session.

Motion was made, seconded and carried, that the House of Delegates recommend to the Councilors of the Society for proper working out the periodical examination of apparently well persons.

A motion was made, seconded and carried that a committee be appointed to investigate Dr. Pos apparatus, as to its efficiency, and report to the Council. A newspaper reporter from the Telegram reported that Dr. Pos claimed to reduce blood pressure and gave treatment for tuberculosis and cancer. Dr. Barbee reported that, as chairman of visiting physicians of Good Samaritan Hospital, he had some knowledge of the apparatus but did not understand how his name had been given as favoring it.

Committee on Public Health and Disease Prevention recommended that they express an opinion in regard to immunization, and that active steps in favor of immunization of diphtheria, scarlet fever, typhoid and smallpox be taken.

Dr. Kuykendall advised that the Board of Councilors was really an executive committee and invited the members to lay all problems they might have before the Board.

Dr. W. B. Morse invited any suggestions members might have be made to the new officers and stated that the key-note for the coming year would be harmony. As an officer of the Society he stated he would welcome suggestions and assistance at all times.

Upon motion duly made, seconded and carried, the meeting then adjourned until 2:00 o'clock p. m.

THIRD SESSION

Friday, April 2, 2 p. m.

A joint meeting of the House of Delegates and the members of the Society was called to order by the President, Dr. Paul Rockey, at 2:00 p. m., in the Grand Ball Room of the Multnomah Hotel, April 2.

The Secretary read the report of the House of Delegates, in which the following names were suggested for election as officers for the ensuing year:

President-Elect: Dr. Hugh Mount, Oregon City.
First Vice-President: Dr. L. B. Bouvy, La Grande.
Second Vice-President: Dr. John Sifton, Hood River.
Third Vice-President: Dr. A. B. Peacock, Marshfield.
Secretary: Dr. Frederick D. Stricker, Portland.
Treasurer: Dr. J. Earl Else, Portland.
Trustee of Am. Med. Ass'n., J. A. Pettit Portland.
Advisory Counsel, C. H. Carey, Portland.
Three members of the Council: Drs. E. B. McDaniel, Wilson Johnston and E. E. Fisher, terms expiring 1924.

It was moved and seconded that inasmuch as Dr. Hugh Mount was nominated as president-elect for the ensuing year Dr. Frank Mount be elected as Councilor in place of Dr. Hugh Mount. Carried.

The Secretary was then instructed to cast the unanimous vote of the Society for the above officers for the ensuing year, and all were declared elected.

The following resolutions were adopted:

Whereas, Medical men, although coming in daily contact with sickness and death, find it necessary to pause to note the passing on of fellow members of our profession, and

Whereas, It is fitting that at each annual meeting of the Oregon State Medical Society suitable recognition be made of the deceased members, and

Whereas, During the past year we were compelled to announce the death of Drs. O. M. Dodson, of Baker, Honorary Member of the Society; N. C. Nelson, of Eugene, and Charles Franklin Loeding, members of the Society, as well as the following members of the profession: Drs. James T. McCormac, of Marshfield; H. S. Garfield, of Pendleton; Dean Gilkey, of Eugene; George E. Stuart, of Oregon City; T. W. Harris, of Eugene; D. M. Ward, of Forest Grove; L. C. McCabe, of Portland; Walter Lovejoy, of Baker; Flora A. Brown Casseday, of Portland; Ernest Barton, of Portland; Herschel E. Curry, of Baker; W. C. Hawk, of Bay City, and Harold Edwards Bates, of Portland; therefore be it

Resolved, That the Oregon State Medical Society now assembled in Portland, be called upon to stand momentarily for the adoption of this resolution in memory of the deceased physicians above named. Be it further

Resolved, That the Secretary of the Society be instructed to spread this resolution in the minutes of the meeting, and that a copy be furnished to the families of the deceased.

The following resolution was prepared by direction of the Council for submission to the House of Delegates:

Whereas, Legislation controlling the labeling and sale of dangerous caustics in packages for household use was enacted by the Oregon Legislature at the 1924 session, and

WHEREAS, Control of interstate commerce in household packages of dangerous caustics is an important factor in the elimination of this hazard to human life, be it therefore

RESOLVED, That the Oregon State Medical Society hereby call upon the Senators from Oregon to use all possible efforts to secure the enactment of Senate Bill 2320 (Senator Pepper), safeguarding the distribution of dangerous caustics as hereinbefore mentioned.

In accordance with the report and recommendation of the Committee on Public Health and Disease Prevention in the matter of preventable diseases,

WHEREAS, There were 263 reported cases of typhoid fever, with 32 deaths, in the state of Oregon during the year 1925, and

WHEREAS, There were 1370 reported cases of diphtheria, with 101 deaths, in the state of Oregon during the year 1925, and

WHEREAS, There were 1408 reported cases of scarlet fever, with 18 deaths, in the state of Oregon, during the year 1925, and

WHEREAS, There were 863 reported cases of smallpox, with 2 deaths, in the State of Oregon, during the year 1925, and

WHEREAS, There are now methods of definite immunization against these four diseases, therefore be it

RESOLVED By the Oregon State Medical Society that an active, state-wide campaign be instituted to carry into effect as far as possible immunization against typhoid fever, diphtheria, scarlet fever and smallpox.

Motion was made, seconded and carried, that the business meeting of the Society be adjourned and the scientific program resumed.

PROGRAM OF ANNUAL MEETING

THURSDAY, APRIL 1, 1926

OPENING SESSION

GRAND BALL ROOM—MULTNOMAH HOTEL

9:00 A. M.

Registration of Delegates and Members.

10:30 A. M.

President's Address..............................Dr. Paul Rockey

SCIENTIFIC PROGRAM

"Diagnosis of Intracranial Lesion"........Dr. Geo. Swift

1:00 P. M.

Luncheon—Tea Garden Room, Multnomah Hotel.

AFTERNOON SESSION

2:00 P. M.

SCIENTIFIC PROGRAM

"Treatment of Postoperative Pulmonary Abscess," Dr. Emile Holman, Associate Professor of Surgery, Leland Stanford Medical College, San Francisco, Calif.

"Nonrelation of Malnutrition to the Incidence of Infectious Disease," Dr. H. W. Hill, Professor of Public Health, University of British Columbia, Victoria, B. C.

7:00 P. M.

ANNUAL BANQUET OF STATE SOCIETY

GRAND BALL ROOM—MULTNOMAH HOTEL

Program arranged by City and County Medical Society.

FRIDAY, APRIL 2

MORNING SESSION

9:00 A. M.

SCIENTIFIC PROGRAM

"Certain Considerations of the Technic of Skin Grafting" ....Dr. Emile Holman

"Modern Methods of Vaccination"..........Dr. H. W. Hill

2:00 P. M.

GENERAL MEETING

Election of Officers

Dr. Herbert M. Green introduced Colonel F. T. Arnold and Major G. J. Gonser.

Colonel F. T. Arnold, Chief of Staff of the 96th Division, Organized Reserves, stationed in Portland, talked on organization of a reserve corps and the need for medical officers to officer the medical units of the organized reserves and the desirability of their applying for reserve commissions and getting assignments so they would have an even start in case of another national emergency.

Major G. J. Gonser explained the mode of appointment of reserve officers and their assignments and duties and also spoke about the regular Carlisle and Kelly Field for field surgeons.

SCIENTIFIC PROGRAM

"Treatment of Certain Types of Epilepsy"................ ....Dr. George Swift, Seattle, Wash.

"Physiology, Surgery, and Treatment of Arteriovenous Fistula, Experimental and Clinical........ ....Dr. Emile Holman

"The Intratracheal Injection of Lipoidol in the Differential Diagnosis of Pulmonary Suppuration with Special Reference to Bronchiectasis," Dr. Ralph C. Matson, Portland.

SATURDAY, APRIL 3

Golf.

Automobile Trips.

WASHINGTON

CLALLAM COUNTY MEDICAL SOCIETY

Pres., F. T. Hyde; Secty., W. H. Taylor

Clallam County Medical Society held its annual meeting at Port Angeles April 14, in conjunction with the meeting of the dental society.

Dr. O. Jensvold read a paper on Pyhorrea. The paper was discussed both from the medical and dental standpoint.

MEDICAL WEDDING. Dr. C. G. Magee, of Moscow, was married April 5 at Nelson, B. C., to Miss Dawn Marie Hume of that city.

DR. DAVID J. EAKIN, who has resided for many years at Spokane, died at LaGrande, Ore., April 16. He was 95 years of age.

DR. R. V. MOORE, of Portland, has sailed for Europe, where he will devote several months to postgraduate study.

KING COUNTY MEDICAL SOCIETY

Pres., W. C. Woodward; Secty., O. H. Christofferson

A general meeting of King County Medical Society was held at Seattle, Wash., April 5, at 8:15 p.m., Vice-President C. E. Watts being in the chair. There were 110 members present. Minutes of the meeting of March 8 were read and approved. A letter was read from Colonel H. V. Wurdemann, relative to the applications for membership in the Medical Officers Reserve Corps.

Applications of Drs. Robert Freeman and H. G. King for membership in the Society were read.

The applications of Drs. Hilda A. Simon and Henry H. Schwartz were voted on, and they were duly elected.

Dr. Frederick Willius of the Mayo Clinic presented the paper of the evening on "Newer Methods in the Treatment of Heart Disease." The paper will be published soon in Northwest Medicine. It was discussed by Drs. J. M. Blackford, P. V. von Phul and L. J. Palmer.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. F. Dodds; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in its rooms at Tacoma, Wash., April 13, Dr. E. F. Dodds, president, in the chair. Minutes of the previous meeting read and approved.

Dr. Whitacre presented two cases of sacroiliac injury, treated by the Smith-Petersen operation and pubic grafts. Both cases were totally disabled before operation and are now able to do ordinary work.

A paper, "Tacoma's Diphtheria Mortality," was read by Dr. L. A. Hopkins. He called attention to articles in a recent issue of the *Journal of the American Medical Association*, listing Tacoma as fourth from the top in diphtheria mortality among ninety cities of 100,000 population. The paper was discussed by Dr. Engels.

Dr. Griggs moved that a contagious disease commitee be appointed to carry on a program of information and education for physicians.

A paper, "Complications Following Tonsillectomy," was read by Dr. A. W. Howe. It dealt with such complications as pneumonia, lung abscess, middle ear disease, hemorrhage and resulting scars. It discussed the too early removal of tonsils, asserting that many infections of childhood were developed because of early removal of protective tonsil tissue. The paper was discussed by Drs. Hillis, Wheeler, Alice Smith and Kinnear.

Dr. Alice Smith spoke of furnishing reports to insurance companies and lawyers without remuneration.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., J. T. Dowling; Secty., M. J. Morris

The monthly meeting of Puget Sound Academy of Ophthalmology and Oto-Laryngology was held at St. Helen's Clinic, Tacoma, Wash., April 20, 1926. Dr. Chase called the meeting to order at 8:00 p. m.

The first cases were presented by Dr. Balabanoff. They were two mastoid cases with a suboccipital extradural abscess, and the other a case of tuberculous laryngitis.

Dr. Davies presented a laryngeal case with suspected malignancy in a patient sixty-nine years of age; a case with a corneal wound caused by a piece of steel; and a case of a ruptured cornea.

Dr. Wheeler presented two eye cases; one, a patient with adhesions of the eye-socket or symblepharon; the other a case of postcapsular lens opacity.

Dr. Cameron presented a case of arthritis deformans with luetic scleritis, and another with edema of the conjunctiva.

Two cases were presented by Dr. Lundvick; one, a megalocornea case, the other, an old perforating injury of the eye.

A case of chronic conjunctivitis lasting seven years was presented by Dr. A. W. Howe. Also a case of keratitis disciformans.

All of the above cases were generously discussed.

The paper of the evening was read by Dr. E. E. Maxey. "The Effect of Impaired Vision on Lincoln's Personal Habits." It was discussed by Drs. Harter, Cameron, Wheeler, Davies, Goss, Balabanoff, Chase and Howe.

A motion was made and carried that, while Dr. Chase is in San Francisco, at the Pacific Coast Oto-Laryngological Society's meeting, best wishes and greetings be extended to Dr. N. P. Wood who is ill in a hospital there, and to also present him with flowers.

A motion was made and carried for the Secretary to write Dr. Plummer a letter expressing the regrets of the members of the Society for his present incapacity and wishing him a speedy recovery.

A motion was made and carried that the dues of Dr. Wood and Dr. Plummer be remitted and the doctors kept in good standing as long as they are incapacitated.

WALLA WALLA COUNTY MEDICAL SOCIETY

Pres., E. L. Whitney; Secty., A. E. Lange

A meeting of the Walla Walla County Medical Society was held at Walla Walla, April 8. There was an excellent attendance from the membership.

Dr. S. S. Oppenheimer, of Spokane, president of the state medical association, paid an official visit to the society and addressed the members regarding the approaching state meeting at Spokane and other matters pertaining to the association and its welfare. Dr. George Downs, of Spokane, read a paper on "Injuries of the Head."

IDAHO

SOUTHWEST IDAHO DISTRICT ASSOCIATION

Pres., H. W. Stone; Secty., B. W. Mather

South Idaho District Medical Association held its annual spring meeting at Boise April 2, attended by about sixty physicians. An unusual interest was displayed by all in attendance and it was one of the most successful ever held in that part of the state.

The following program of papers was presented:

"Recent Progress in the Management of Puerperal Infections," Dr. T. N. Braxton, Boise.

"Tumors of the Orbit," Dr. George M. Constans, Fellow Mayo Clinic Foundation.

"Plastic Surgery," Dr. Thomas Mullen, Pocatello.

"Newer Methods in the Treatment of Heart Disease," Dr. Frederick Willius, Mayo Clinic.

The following officers were elected for the ensuing year: President, Dr. O. H. Parker, Boise; vice-president; Dr. T. N. Braxton, Boise; secretary-treasurer, Dr. Albert Beek, Blackfoot.

Treatment of Functional Uterine Hemorrhage. Uterine bleeding may be observed in the entire absence of any demonstrable gross lesions of the pelvic organs. Cases of this type are commonly designated as "functional," "idiopathic" or "essential." In a rather large experience with this form of uterine bleeding from both the clinical and pathologic standpoints, Emil Novak, Baltimore (*Journal A. M. A.*, April 10, 1926), has been impressed with the fact that the profession as a whole and, indeed, gynecologists as a group, have not yet come to appreciate the real nature and significance of this form of menstrual disturbance, as well as its great importance from the standpoint of differential diagnosis. Too often a diagnosis of "idiopathic" hemorrhage is made without proper measure to exclude the possibility of other and often far more serious lesions, such as cancer. Even when the diagnosis is correct, many practitioners prescribe ergot, stypticin or other drugs of this sort, without any real pharmacodynamic justification. Novak outlines a plan of management. When the bleeding is sufficiently severe to cause concern in young women, and even more emphatically during middle age, the importance of diagnostic curettage cannot be too strongly urged. A failure to demonstrate hyperplasia should at least lead to a suspicion of some unsuspected anatomic lesion, such as a submucous myoma or an intrauterine polyp. Only by diagnostic curettage can the existence of adenocarcinoma of the corpus be excluded. The far more common type of uterine cancer, i.e., squamous cell carcinoma of the cervix, can usually be readily diagnosed by inspection and palpation, with microscopic examination of biopsy sections in doubtful cases. In cases of bleeding in middle aged women who are still menstruating, when diagnostic curettage is indicated because of the absence of more obvious causes of the hemorrhage, the benign hyperplasia will be found considerably more often than adenocarcinoma. The latter is much more apt to be noted in women who have passed the menopause. In most cases, curettage will be followed by relief from the hemorrhage. In many cases this will be permanent, but in a large proportion, certainly in not less than one half, recurrence of the symptoms will be noted, perhaps almost immediately, though in other cases not until many months later. In some cases, the success of a curettage may merely reflect a coincident spontaneous curative tendency; in others, it may perhaps be interpreted as in some way altering the biocehmical condition of the endometrium. The results of organotherapy can scarcely provoke any great degree of enthusiasm. Often they are distinctly gratifying, and certainly organotherapy is far more rational than drug medications. When there are other manifestations of hypothyroidism, thyroid extract should by all means be resorted to, and will often be of great benefit.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Nephritis. By Herman Elwyn, M. D., Assistant Visiting Physician Gouverneur Hospital, New York. Cloth, 347 pp. The Macmillan Company, New York, 1926.

This moderate sized volume purports to include the most modern and advanced facts concerning nephritis. It is dedicated to Professor Franz Volhard, "the master in this field of medicine." The book evidently embodies to a great extent the work of Volhard or Halle in kidney lesions, which rather predominates in Germanic counties at present, or rather the work of Volhard and Stauss. The classification of renal disorders is herein not so simple, as that for example of Christian and Hare in Oxford Medicine, and some of the theories expounded do not seem so rational as those of Christian. For example, essential hyptertension is called "arteriolosclerosis without loss of renal function." It is considered to be caused by arteriosclerosis and narrowing of the glomerular arterioles but, as pointed out by Christian in the earlier stages of essential hypertension, the pathologic changes in the kidneys are slight, and even in later stages the sclerosed glomeruli are so much less marked than in chronic nephritis that it would seem more rational to consider the kidney lesions secondary than causative. However, the theory of the etiology of hypertension advanced by Elwyn is plausible. First, an hereditary tendency to arteriosclerosis, and, second, a peculiar vasomotor instability whereby patients react constantly and intensively to stimuli that do not affect the ordinary individual. That is, in hypertensive persons one sees ready flushing of the skin, great erythematous areas arise on slight excitement and, again, they are very sensitive to cold and exhibit pallor, "dead fingers," etc.

Malignant hypertension Elwyn describes as "renal arteriolosclerosis with renal insufficiency." There is another objection to the use of renal arteriosclerosis (the unpronouncable term above is omitted) in that we commonly recognize it as a subdivision of general arteriosclerosis, in which perhaps the kidneys chiefly participate. Clinically these cases do not at all resemble hypertension, as pressure is more often low than high, and the renal lesion is of subsidiary import.

The pathologic classification of Volhard followed in this treatise is much more complicated than that of Christian and, because there are many points that make a classification based on pathology impossible to apply clinically, and because there is no general agreement among pathologists themselves as to standard classification, it seems that the simpler the classification the better for clinicians. It is stated that "the essential cause of acute diffuse glomerular nephritis is still an unsolved problem," and that "there is no definite proof that the streptococcus is responsible for acute diffuse nephritis." In this country McKim Marriott has done much to prove that this form of nephritis is due directly to the toxins of hemolytic streptococci, resulting from infections of the tonsils, middle ear and mastoid, rarely from the accessory sinuses. His work is particularly valuable because relating to children, in whom many other supposed sources of nephritis may be eliminated.

Also under the etiology of chronic diffuse glomerular nephritis we read that it "is always the result of a previous acute diffuse nephritis." The underlying idea here is that there are continuing attacks of acute nephritis, some of which are so slight as to pass unnoticed and all the time destruction of glomeruli goes on. But the causative factor is thought to be the same as in the acute form (whatever that may be). This, to the reviewer, is much the most logical explanation of chronic glomerular nephritis, although Christian doubts that chronic nephritis is a sequence of the acute form in most cases. This doubt is based on the fact that most patients with chronic nephritis have no history of an acute nephritis, that the onset is unknown and has no connection with any known infection, and, again, because so many persons have all kinds of infections without developing nephritis. This last reasoning will have little weight because of varying degrees of resistance and affinities in various tissues.

Kydd's work in showing the constant escape of bacteria from focal infections in showers into the blood and from the kidneys throws most light on the gradual destruction of renal tissue in chronic glomerular nephritis. The reviewer has seen two cases of acute nephritis in one family following acute tonsillitis, one progressing for twenty years into a typical fatal chronic glomerular (or interstitial) nephritis, owing to retention of the infected tonsils, and the other remaining with little damage to the kidneys because of tonsillectomy. Christian's statistics touching vascular hypertension show no increased incidence of infections in hypertensive cases as compared to other patients of the same age without hypertension. Nevertheless the general trend seems all in favor of infection as a cause of nephritis and Christian accords this in the etiology of acute nephritis.

This book on the whole is an admirable attempt to fit pathologic phenomena to clinical findings in nephritis, which at present is an impossible task. Notwithstanding, the work represents the best Continental thought and work on nephritis and cannot fail to prove of practical value to the reader, providing he can translate the nomenclature of the book into the simpler and more comprehensive classification of our own authorities, as in Oxford Medicine.

WINSLOW.

YOUNG'S PRACTICE OF UROLOGY. Based on a study of 12,500 cases. By Hugh H. Young, M. D., and David M. Davis, M. D., Johns Hopkins University. With the collaboration of Franklin P. Johnson. Two octavo volumes totaling 1484 pages with 1003 illustrations, 20 being color plates, by William P. Didusch. Philadelphia and London: W. B. Saunders Company, 1926. Per set: Cloth, $25.00 net.

This two-volume work deserves a great deal of praise and close inspection by all those who are at all interested in this branch of medicine and surgery. While the author and editor have surveyed and quoted widely the urologic literature of Europe and America, it is distinctly the result of the cases which have been treated at the Brady Urological Institute, the Urological Department of Johns Hopkins University. These volumes have been made possible by the able men who have been resident surgeons in that institution, a few of whom are the following: Alexander Randall, Professor of Urology at the University of Pennsylvania; John R. Caulk, Professor of Urology at the St. Louis University; J. T. Geraghty, Johns Hopkins University (deceased); Frank Hinman, Professor of Urology, University of California; William A. Frontz, Johns Hopkins University; William C. Quinby, Harvard University. In the preface two men of the Northwest have also been mentioned: R. F. Hain, of Seattle; F. P. Johnson, of Portland.

As the various subjects are taken up, we find reports of the treatment and the results incorporated into the pages, showing the careful studies that are made upon the hospital cases. The papers on urogenital infections and infestations are elaborate and very complete. They include many microphotographs of tissue from their case records. Many of the subjects which in the past have been underdeveloped in text books on urology are extremely well worked out in these volumes. For example, obstructive uropathy, neoplasms of the kidney, ureter, bladder, urethra, testes, and scrotum, the malformation of the uretogenital tract with the embryologic developments are most complete. There is an excellent chapter on urology of infancy and childhood, a branch of urology which has only been taken seriously in the past few years.

As a result of his services in the American Expeditionary Forces in France, Young has added a chapter on urology and urologists of the war. He closes his volumes with a description of the Brady Institute, the arrangement of the clinic, and a few words on the teaching of urology. The ability and personality of Dr. Young have made possible this splendid organization, the Urologic Clinic, which has turned out some clever men who have contributed greatly to the knowledge of urinary diseases, served their institution well, and then scattered to various parts of the United States to carry on their teaching and research. To sum up, Young's Practice of Urology is the product of the Brady Urologic Institute. It is well written, beautifully illustrated, and a very considerable contribution to the medical profession.

PEACOCK.

THE PRINCIPLES AND PRACTICE OF ENDOCRINE MEDICINE. By W. M. Berkeley, Ph.D., M.D. Recently Attending Physician at the Good Samaritan Dispensary, New York and one time Director of the Laboratory of Experimental Medicine, Cornell University Medical School. Illustrated. Cloth, 361 pp. $4.50. Lea & Febiger, Philadelphia and New York. 1926.

This book embodies exactly what has been for a long time a great desideratum in medicine, i.e., a treatise giving all the facts in respect to endocrinology in a comprehensive but concise form, and applied to clinical medicine. Heretofore we have had a great number of profuse dissertations on the subject, including all that is known and dreamed of in relation to the internal secretions on the one hand and, on the other, the ascertained concrete facts boiled down to the last degree, as in our standard textbooks on medicine. Not only are all the physiologic data discussed at length but also the symptoms, diagnosis and treatment of endocrine diseases and "many details of treatment and dosage are given which have hitherto been inaccessible in print in any language," according to the author, and we believe that he does not overstate his case.

Under diseases of the thyroid gland the writer restricts himself to describing Graves' disease, simple goiter, cretinism, myxedema and minor thyroid troubles. Why he omits toxic adenoma, for instance, is not readily discernible, except that it is not amenable to thyroid therapeutics. The sections on minor thyroid troubles (hyper- and hypo-), and on thyroid administration are particularly commended. There is an interesting chapter on parathyroid glands and diseases, and particularly on the use of the extract in paralysis agitans, in which Berkeley has had a large experience.

The chapter on the physiology and diseases of the pituitary gland is admirable. The author quotes Cushing that "there is every reason to believe that the cases of clinically recognizable pituitary disease are at least as common as the clinically recognizable thyroid disease. It is unquestionable that in only a small proportion of individuals affected with low grade functional diseases of the thyroid is the nature of the malady appreciated. How much more this is true of pituitary disorders needs no comment." The section dealing with diabetes insipidus is particularly interesting in view of the fact that the etiologic factor of the posterior lobe of the pituitary gland has been questioned. The miraculous effect of pituitrin, one dose arresting polyuria that may have existed a year, cannot but impress one as to the origin of the disease. The reviewer has treated two cases of diabetes insipidus with pituitrin, and one made a complete recovery with the addition of salvarsan in the presence of negative Wassermann reaction.

Berkeley affirms that "there can no longer be a clinical question that a properly made ovarian extract is absorbed as such by the stomach and bowel and that it actually produces or helps to produce the specific effects that may reasonably be expected of it." This is in opposition to Cushing who stated sometime since that there is no proof that any of the internal secretions, except the thyroid, are absorbed as such when given by the mouth. The book is valuable, as stated above, because it gives known facts about the endocrines and especially because it applies them to the treatment of disease.

WINSLOW.

APPLIED BIOCHEMISTRY. By Withrow Morse, Ph.D., Professor of Physiological Chemistry and Toxicology, Jefferson Medical College, Philadelphia. Octavo of 958 pages with 257 illustrations. Philadelphia and London: W. B. Saunders Company, 1925. Cloth $7.00 net.

The author has written this book with the idea of giving "only such material as is definitely related to medicine as a whole." He has, however, succeeded in incorporating enough of the science to stimulate the reader to go farther, and has indicated the paths the student may follow to get the information he desires. The book is profitable reading for the clinician, as he will find much of practical value, though he will not feel that the day is very near when "the treatment of disease will be as sure and as certain as the neutralization of ammonia by sulphuric acid."

Medicine and surgery have been greatly advanced by biochemistry and the practitioner must keep up on this subject to be most efficient. This book can be recommended for that purpose. The author discusses foods, their digestion and absorption, the vitamines, the chemistry of the blood and excretions, and gives technic for examination of the blood and urine. There is a good discussion of calcium and metabolism, but no technic is given for the determination of blood calcium.

GRISWOLD.

A TEXT BOOK OF PHYSIOLOGY. By William D. Zoethout, Ph. D., Professor of Physiology in the Chicago College of Dental Surgery (Loyola University), etc. Second Edition. 616 pp. $4.50. The C. V. Mosby Company, St. Louis, 1925,

The author states that this book is intended to fill the gap between larger texts, of which there are many in the field, and those offering a briefer course. It is intended for those having a limited length of time for the acquisition of the basic knowledge of the subject. The first six chapters are devoted to physiology of the various constituents and tissues of the body, with a discussion of their mechanisms and actions. Other chapters are devoted to special elements of the body, such as the blood and its circulation, respiration, metabolism, animal heat. Other chapters consider foods, digestion and diet. By reading this volume one will acquire a general knowledge of the physiology and functions of the human body.

HANDBOOK OF DISEASES OF THE RECTUM. By Louis J. Hirschman, M. D., F. A. C. S. Professor of Proctology, Detroit College of Medicine, etc. With Two Hundred Fifty-two Illustrations, Mostly Original, and Five Colored Plates. Fourth Edition, Revised and Rewritten. 404 pp. $6.50. C. V. Mosby Co., St. Louis, 1926.

Perhaps no branch of medicine is more neglected by the profession than that of proctology. This has resulted in a great deal of this work being taken over by the advertising quack, often to the detriment of the patient and the medical profession. No book ex-

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tant has done as much as the handbook of Hirschman's to help the general practitioner along this line. The quack draws his large clientele from the fear the ordinary individual has of a rectal operation. Much of this work can be done in the office under local anesthesia, to which the patient will usually submit. If told that he must go to the hospital and take a general anesthetic, he is often driven into the office of the charlatan.

The writer of this review had the pleasure of working under Dr. Hirschman during the period of preparation of his first edition of this work and knows that the methods as delineated are those exactly as used by the author so successfully in his private and hospital practice. The book is beautifully illustrated and the text plain and concise. It should be in the library of every physician who does any of this work.

CROOKALL.

A POCKET CYCLOPEDIA OF MEDICINE AND SURGERY, Based upon the Fourth Edition of Gould and Pyle's Cyclopedia of Practical Medicine and Surgery. Third Edition, Revised, Enlarged and Edited by R. J. E. Scott, M. A., B. C. L., M. D., New York, Fellow of the New York Academy of Medicine, etc. 922 pp. $2.50. P. Blakiston's Sons and Company. Philadelphia, 1926.

This "Pocket Cyclopedia" is intended as a handy book of reference for the busy practitioner. It consists of brief articles, alphabetically arranged, on various subjects in the field of medicine and sciences. It includes drugs, anatomic terms, tests, tables, etc., and describes many facts of general interest concerning them. This does not replace the text book or monograph on any medical subject, but summarizes the essential facts of many conditions of disease and their treatment.

THE SURGICAL CLINICS OF NORTH AMERICA (Issued serially, one number every other month.) Volume V. Number VI. Philadelphia Number—December, 1925.) 223 pages with complete index to volume 5 and 50 illustrations. Per clinic year (February, 1925, to December, 1925.) Paper, $12.00. Cloth. $16.00 net. Philadelphia and London. W. B. Saunders Company.

In this volume the Deaver Clinic recites a series of fifteen operations, mostly on abdominal conditions, the essential facts of each being given in the usual and decisive style of the operator. There is a long series of reports from the Muller Clinic. It contains a symposium on lung abscesses, with different aspects of this condition discussed by five operators, which presents an interesting summary of this form of disease. There is also a symposium on chronic gallbladder disease, different features of which are described in these reports. One can obtain the usual amount of valuable information from this volume.

SURGICAL CLINICS OF NORTH AMERICA, Vol. VI, No. 1. (Philadelphia Number), February, 1926. 325 pp., with 136 Illustrations.

Among the many valuable clinic reports of this volume only a few can be mentioned. The clinic of Babcock presents a demonstration with technic of spinal anesthesia. This is followed by a description of a series of operations, including such conditions as cholecystitis, a new operation for aneurysm of thoracic aorta, epididymitis, intraabdominal adhesions and suspected brain tumor. The gynecologic clinic of Clark includes reports on various phases of uterine myoma, treatment of carcinoma of the cervix and the fundus, with other instructive gynecologic operations. A fracture symposium appears in the clinic of Eliason. Different surgeons consider various fracture problems with illustrative clinical cases. There are many more equally valuable surgical discussions.

MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume IX, Number IV, Tulane University Number, January, 1926. Octavo of 381 pages, with 49 illustrations. Per clinic year, (July, 1925, to May, 1926.) Paper, $12.00; Cloth $16.00 net. Philadelphia and London: W. B. Saunders Company.

This volume presents clinics by thirty St. Louis physicians. Three of these deal with amebic dysentery. Simon presents some unusual types with descriptions of treatment. Reports by Johns and Silverman discuss the use of stovarsol in this condition. There does not appear to be unanimity of opinion as to the usefulness of this preparation. In the discussion of quinidin in the treatment of auricular fibrillation, Duffy warns against its indiscriminate use, stating that the patient should first be tried out with digitalis to demonstrate the curability under the administration of quinidin. Most of the organs of the body are considered in some of these clinical reports.

PRACTICAL VALUE OF EXAMINATION FOR ENDAMEBA HISTOLYTICA BY CULTURE. J. H. St. John, Washington, D. C. (*Journal A. M. A.*, April 24, 1926), records his experience with culturing amebas in four cases. In one case, the culture was positive in twenty-four hours, and the ameba recovered was identical with that observed in direct examinations. By subculturing every forty-eight hours, this ameba has been carried in culture for the last four months. In another case, the ameba has been maintained in culture for the last three months; in a third case, for a period of two months. In cultivation, a specimen of stool, 48 hours old, contained a moderate number of cysts of *E. histolytica*. Motile amebas, *E. histolytica*, were recovered in culture at the end of twenty-four hours incubation. The stool was placed in the icebox, and subcultures were taken after a lapse of eight days, when motile amebas were again recovered. St. John says that the movement and form taken in movements are sufficiently characteristic of the large strains of *E. histolytica* to aid materially in its identification. The rate of movement in culture calculated from that of four active specimens, is 27.9 microns to the minute, or slightly less than 1½ inches a day. So characteristic is the movement of *E. histolytica* that any entozoic ameba obtained from man in culture which is found to move actively across the field of the microscope should at once incite a strong suspicion that the ameba in question is *E. histolytica*. St. John feels that it is probable that the application of the cultural method to surveys of the population will necessitate a revision upward of the incidence of amebas in man.

NORTHWEST MEDICINE

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ORIGINAL CONTRIBUTIONS

CELIAC DISEASE*

INTESTINAL ATROPHY WITH DILATATION, CHRONIC DIGESTIVE INSUFFICIENCY, CHRONIC INTESTINAL INDIGESTION, INTESTINAL INFANTILISM (HERTER), PANCREATIC INFANTILISM (BRAMWELL), CHRONIC FAT INDIGESTION, FAT INTOLERANCE, ACHOLIA (CHEADLE).

JULIUS H. HESS, M.D.
CHICAGO, ILL.

This type of chronic intestinal indigestion which is accompanied by dilatation of the small and large intestines and in most cases demonstrable atrophy of the intestinal wall, most marked in the mucosa, has such a characteristic symptomatology that it may be classed as a clinical entity. Although this affection was originally described by Gee[1] in 1888, little has been added to this classical description of the symptom-complex.

"The onset is usually gradual, so that its time is hard to fix. Sometimes the complaint sets in suddenly, like an accidental diarrhea; but even when it is so, the nature of the disease soon shows itself. The patient wastes more in the limbs than in the face, which often remains plump until death is nigh. The belly is mostly soft, doughy, and inelastic; sometimes distended and rather tight.

"Signs of the disease are yielded by the feces; being loose, not formed but not watery; more bulky than the food taken would seem to account for; pale in color as if devoid of bile; yeasty, frothy, an appearance probably due to fermentation. The pale, loose stools look very much like oatmeal porridge or gruel.

"The course is always slow, whatever be its end. Whether the patient live or die, he lingers ill for months or years. Recovery is complete or incomplete. While the disease is active, children cease to grow; even when it tends slowly to recovery they are left frail and stunted."

Before undertaking a more detailed description of this disease we should first of all distinguish between acholia and celiac disease and realize clearly that acholia is a main feature of celiac disease, but that it can occur independently and without developing into a more serious affection. Acholia may be simple in origin and temporary in duration. It occurs in catarrhal jaundice, i.e., catarrhal duodenitis with obstruction to the flow of bile into the duodenum, as a temporary incident in infancy. Some infants, when fed with an excessive amount of cow's milk, more especially when they have a tendency to fat indigestion, will pass stools of a similar type. These cases are not to be confused with celiac disease; they may, however, be forerunners of the more serious conditions if left uncorrected.

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* Read before Thirty-third Annual Meeting of Idaho State Medical Association, Pocatello, Ida., Sept. 3-5, 1925.

Incidence. The characteristic physical and clinical manifestations in most instances become evident between the ages of nine and eighteen months. Occasionally it will be diagnosed earlier if suspected. In rarer instances it does not become apparent until the third to sixth years. In my own experience the sex has been about equally distributed; others report it as being more common in girls. The recorded cases have ordinarily been described as belonging to the upper classes. To a large extent this may be accounted for by the fact that, due to lack of proper care and indiscretions in the diet among the poor, the recurrent attacks of acute indigestion with intermittent infections prove fatal.

Etiology. Improper feeding is an outstanding factor in the history of a great number of cases. While it is exceptionally rare during the period of exclusive breast feeding, two of my cases developed while the infants were still at the breast, one during the thirteenth and the other the fourteenth month of life. With bottle fed infants there is usually a history of too prolonged cow's milk or proprietary food diets with delayed introduction of other foods. A vitamin deficiency with resulting scurvy is reported by Still in several of his cases. Excessive fat feeding and improperly cooked cereals, vegetables and especially potato may be the cause of diarrheal attacks which may become forerunners of the condition. The infants are usually delicate and give evidence of nutritional disturbances. Most of the cases give a history of a previous severe or prolonged attack of diarrhea as a precipitating cause, following which the typical clinical picture develops.

While most of the literature fails to emphasize the presence of rickets, it has been demonstrable in most of my cases, both breast and bottle fed. As to whether rickets is the result of the same factors which cause this disease or a direct factor in some, due to the accompanying intestinal atony and disturbance in the salt metabolism, can only be determined by further studies in individual cases.

Other hypotheses as to etiology include chronic infection with one of the types of dysentery bacilli; or an overgrowth of other proteolytic bacteria in the intestines; deficient or defective pancreatic, or bile secretion, and vitamin deficiency. Defective fat splitting plays a prominent role. The characteristic fatty stools are in all probability not a result of indigestion, per se, but due to an insufficiency in fat absorption.

Howland[2] states, "The question of an insufficiency of bile or of intestinal ferments cannot be settled with our present knowledge. In almost all the diseases of the intestine in infancy and childhood the ferments are qualitatively present and we have no means of measuring them quantitatively. The appearance of the stools suggests acholia but chemical examination shows bile."

Pathology. The number of authenticated cases reported with pathologic findings are very few. No constant pathologic findings have been reported. The liver has usually been reported as smaller than normal, occasionally as enlarged and showing fatty degeneration. In a few cases there has been evidence of pancreatitis with increased interlobular fibrous tissue. The intestinal tract always shows dilatation, most marked in the colon and usually some thickening of the walls of the large intestines, due to a small round cell infiltration of the mucosa and marked in the submucosa. Atrophy of the intestinal wall is often present, most marked in the mucosa. The question has been raised as to whether the pathologic changes described in individual cases were primarily dependent upon the disease or the result of superimposed conditions.

Symptoms. In its typical form it is always chronic. It is usually slow in development, becoming manifest late in infancy. The clinical picture is usually precipitated by an enteral or parenteral infection, associated with diarrhea. The children show evidence of arrested development; they are undersized and underweight. The extremities are ordinarily small, subcutaneous fat is lacking, the chest is poorly developed and the abdomen large and protuberant. Their appearance led Bramwell[3] to describe them as cases of "infantilism." There is a general muscular weakness and as a consequence they are late in learning to walk. Spinal curvature is of common occurrence. In mental development they may be normal or even precocious; however, in most cases they are not on a par with children of their own age, although their mental ability is usually in advance of their physical development. They are capricious in behavior and appetite and difficult to train properly, often becoming little tyrants, with a tendency to become hypochondriacal.

With change of environment and attendants and the institution of proper feeding, the beneficial changes in both their physical and mental characteristics are rapid. They are subject to violent fluctuations in weight. The size of the abdomen is the most striking feature of the condition. This is chiefly due to the dilatation of the colon, although the smaller intestines are also involved but usually to a lesser degree. It occurs as the result of an excessive fermentation of food, with accompanying weakness of the muscular wall of the intestine. Lack of tone of the abdominal wall is an added factor. Tympanitis is constantly present, although much gas may be passed per rectum. The distention tends to increase during the day and diminish at night.

Vomiting, when present, is usually secondary to marked tympanitis or dietetic indiscretions. Roentgenologic examination often reveals a gastroptosis of a large and atonic stomach, distended intestines and a dilated atonic colon. The latter is best demonstrated by an opaque enema. These findings often lead to a diagnosis of Hirchsprung's disease which can usually be excluded by the history of the time of onset. A deficiency in hydrochloric acid secretion is one of the most constant findings. This is most marked during periods of acute exacerbation.

The stools alternate between constipation and diarrhea, the former being present during the quiescent stages. During the diarrheal stages loss of weight is rapid and all of the symptoms become aggravated. The diarrheal stools are large, gray or greenish-brown in color, acid in reaction and have the appearance of oatmeal porridge. The odor is usually extremely foul. Even during the acute stages the stools are usually limited to from four to six a day. Often fat droplets and undigested food particles are visible and they contain an excess of mucus which is not intimately mixed with the stool. The aggregate amount of stool passed in a day gives the impression of being greater than the food consumed. This is in part due to the mushy consistency and the interspersed gases.

Marriott found that 25 to 75 per cent of the solid matter of the stools consists of fatty acids, soaps and neutral fats. The fatty acids and soaps predominate over the neutral fat. He interprets this as indicating that the fats are well saponified in the gastrointestinal tract but poorly absorbed. The loss of fat and fatty derivatives in the stools may amount to as much as 90 per cent of the ingested fat. There is also an excessive loss of calcium and phosphates in the stools which may in part account for retarded bone development. Calcium deficiency may also be a factor in the lack of stability on the part of the nervous system and the tendency to develop tetany.

The urine shows no characteristic changes. Indican may be in excess. There is usually a high degree of secondary anemia of the chlorotic type, the result of a marked decrease in hemoglobin and a lesser decrease in red blood cells. The spleen may be moderately enlarged but this is not an outstanding feature. The liver is more often decreased in size. Other than rickets, the most marked change in the osseous system is seen in the delayed epiphyseal development.

Complications. In the absence of secondary infection fever is absent or of low grade. A slight fever may be present for weeks at a time. This may increase during acute exacerbations in the symptoms. With secondary infections it varies with the nature of the infection. Other complications are more or less directly related to the dietary restrictions and the assimilation of food. Rickets, more often of moderate degree, has been an almost constant finding in my cases. Tetany, in all probability due to poor absorption of calcium salts, is an occasional complication. More frequently attacks resembling the seizures of petit mal are seen during and after the acute exacerbations and in the presence of acute infections. At such times attacks of dullness, stupor and hyperpnea may develop and may be erroneously mistaken for meningitis. Scurvy may develop and be due to a voluntary refusal of food or a too prolonged use of limited diets. The same dietetic restriction may result in a development of a generalized edema. The latter may be accompanied by ascites and pleural effusion. Purpura of the cachetic type is often a late complication.

Prognosis. The mortality of celiac disease is undoubtedly higher than reported cases would lead one to believe. This is due to the fact that many fatal cases are no doubt erroneously diagnosed, among the poorer classes especially. It is at best a chronic disease marked by periods of improvement with unexpected relapses. The difficulties encountered differ with the individual case. Some of the children make rapid progress, following the institution of proper dietetic measures and in a few years will have attained a normal physical development. In the more severe types the digestive difficulties may persist for several years and the child may not attain its normal physical development until nearing the age of puberty. In every case the prognosis will depend upon the length of time that the condition has prevailed and the degree of cooperation on the part of the child and the attendants.

Treatment. In outlining the treatment of celiac disease due consideration must be given to the stage or type of the condition. Two types have been described which may in fact, however, simply represent different stages of the disease. The first is characterized by voluminous porridge-like nondiarrheal stools, stationary or moderate loss in weight, marked pallor and fatigue; and, second, the more severe type, characterized by voluminous foul odored frothy acid stools with periods of diarrhea. In both types the abdomen is large, the intestinal tract atonic and the child more or less stunted in growth.

While numerous clinicians, especially Gee, Herter[4] and Heubner, call attention to the importance of diets rich in protein, it remained for Howland[5] to demonstrate clinically the vast difference between a diet rather rich in protein and one nearly exclusively protein. In 1921, after years of careful clinical observations in thirty cases of this disease, he pointed out the marked intestinal intolerance to carbohydrate, analgous to the endogenous intolerance in diabetes.

He says, "Halfway measures are quite unavailing and cause only loss of time which is a serious matter. The child with chronic intestinal indigestion is doing badly so long as his distention continues and his stools are foamy and not firm, even in the absence of more serious diarrhea. The indication is to give such a food that the stools become homogeneous and formed, disregarding, it may be for the moment, any consideration of weight.

"The dietary treatment may be divided into three stages. First, that with protein milk alone. More than any other food this is likely to bring satisfactory results. It is preferable to buttermilk on account of its somewhat higher caloric value and especially because of the far lower sugar content. How long the first stage, that of protein milk alone, should be continued depends upon the intestinal reaction and somewhat upon the age of the child but usually it need not be long, a matter of days or a few weeks. It should be continued until the stools are firm, the distention very slight, the gas not in excess and the appetite good.

"The diet of the second stage consists of protein milk as a basis, reinforced by almost pure protein foods. These include milk curd without whey, scraped meat, certain forms of cheese, egg white and eventually the whole egg. The duration of this stage may be many weeks. Such foods supply all the requisites for growth. There is sufficient fat and salts and protein of the best kind in abundance. There is enough sugar in the milk, small as the amount is, to guard against acidosis. There is in addition a large amount of carbohydrate available from the protein. Vitamin A is supplied by the sufficient fat of protein milk, which is for this reason much to be preferred to buttermilk. Vitamin B is supplied by the whey of the buttermilk and the antiscorbutic factor can be given in the form of orange juice or tomato juice, as with any other diet consisting chiefly of milk.

"The third stage, that in which carbohydrates are added, is the really difficult one. The addition must be made very gradually with the most careful observation of the digestive capacity. As with diabetes, the low carbohydrate vegetables form a convenient starting point. When the 5 per cent can be well borne, the 10 per cent may tentatively be added. Bread, cereals and potato are the last articles that can be allowed."

Sauer[6] has outlined a three-phased diet similar to Howland's, using powdered protein milk as a basis. His instructions are as follows: "During the first phase protein milk is the exclusive diet. The initial twenty-four hour diet should consist of several level packed tablespoonfuls of powdered protein milk less than the number of pounds the child weighs. The proper amount of powdered protein milk is mixed with a quart (more or less) of warm (not hot) sterilized water. It may be sweetened with from one-fourth to one grain (0.065 gm.) of saccharin. The mixture is passed several times through a fine sieve (thirty-six wires to the inch). It is then divided into four parts, and placed in the refrigerator until used. The food, gently warmed just before serving, is given from a large holed nipple, spoon, cup or dropper at 6 or 7 a.m., 10 or 11 a.m., 2 or 3 p.m. and 6 or 7 p.m. If anorexia is extreme, a pinch of fat-free cocoa may be boiled in the water before the protein milk is added. A few drops of vanilla extract or of carmin solution sometimes make the food more tempting. Coercion may be necessary the first few days. The child may take the food more readily in strange surroundings, such as a hospital ward.

"The number of tablespoonfuls of protein milk powder should be increased about two every five or seven days. The appetite, age and degree of emaciation are factors which should determine the rate of food increase. This may usually be done regardless of the quality of the stools, for improvement in the general condition and weight increase often begin weeks before the stools are typical 'soap stools.' The food should thus be gradually increased until the number of tablespoonfuls approximates the theoretic number of pounds the child should weigh at that age. The first phase is adhered to until the stools, distention and appetite show distinct improvement. It should never be less than two weeks; usually three or four weeks will suffice.

"During the second phase protein milk remains the essential diet, but is supplemented with almost pure protein foods, such as curds of buttermilk or of machine skimmed milk, scraped lean beef, tongue and egg. These additions must be made very cautiously and the quantities gradually increased from week to week. The increase in the powdered protein milk continues automatically as outlined under the first phase, and such auxiliaries as cod liver oil (from 20 drops to 2 teaspoonfuls twice daily), orange juice (from ¼ to 1 ounce [7.5 to 30 c.c.]), powdered spinach (from 1 to 3 teaspoonfuls) and syrup of ferrous iodid (from 5 to 20 drops daily) may be gradually included in the daily routine.

"During the third phase, carbohydrates, at first dextrized flours (patent barley flour, flour ball or imperial granum), also arrowroot crackers, finely rolled zwieback or toasted white bread are cautiously added. This change in the diet should never be attempted within the first six weeks of treatment; in severe cases about the third or even the fourth month is usually early enough. Small quantities (from ½ to 1 ounce) of dextrose, dextrimaltose or corn syrup are often well tolerated."

Marriott[7] recommends the following regimen: "The diet should be one composed largely of protein with only a minimum amount of fat and carbohydrate. The necessary vitamins and mineral salts must of course be supplied. Three or at most four meals a day are sufficient. Skimmed lactic acid milk (buttermilk) given in amounts of from one to two pints a day is a suitable basis for the diet. This amount of milk does not supply sufficient total food to satisfy the nutritional requirements. Additional protein in the form of casein may be added. The curds from skimmed milk or one of the dried casein preparations on the market (casec, protolac, larosan) can be incorporated in the milk, or the curds can be fed separately with a spoon. From 1 to 3 oz. of dried casein or the curds from one to three quarts of skimmed milk is a suitable amount of protein to be added in this way. A small amount of cod-liver oil can be given in doses of one-half teaspoonful a day without seriously interfering with the digestion. It is best not to give the cod-liver oil all at one time, but to mix it with the feedings. The antiscorbutic vitamin is supplied in the form of a small amount of orange or tomato juice given daily. During the periods of severe diarrhea both the cod-liver oil and orange juice may be omitted. A diet such as that outlined is suitable for a period of time during which the child is recovering from severe symptoms, but is not suitable for long continued use.

"As improvement sets in additions to the diet are made. Some lean scraped beef, chicken, lamb or fish can be given daily to supply additional protein. Gelatin may be given in moderate amounts to most patients. Later one-half or a whole soft boiled egg may be substituted for a meat feeding. The diet as outlined so far is very low in carbohydrate, and it is advantageous to add some carbohydrate as soon as this can safely be done. Commercial dextrin, or Karo corn syrup, beginning with one to two teaspoonfuls a day and gradually increasing up to 2 oz. or more, provided the diarrhea is not increasing thereby. Of the starches, well cooked cereal gruels and rice, toast or baked potato are cautiously added. Some children with celiac disease seem unable to digest potato, others thrive on it. The same may be said of toasted bread. The reaction of individual children must always be taken into consideration. The dried powdered vegetables now on the market are suitable forms for the preparation of purees for children. They can be used at a time when the green vegetables would be likely to cause irritation because of their indigestible residue. Fresh vegetables are, however, of great value and their introduction into the diet should not be too long delayed."

Personally, I have found treatment as outlined by Howland most satisfactory. In most of my cases I have been able to make further protein additions to the diet somewhat earlier than he recommends. The powdered vegetables (carrot, spinach, celery, peas and tomatoes) now available make possible earlier additions of vegetables to the diet. The introduction of orange juice and cod-liver oil should not be long delayed as they can again be withdrawn if advisable. Powdered protein milk can be used instead of that freshly prepared. Fat free lactic acid milk is often well taken when the less palatable protein milk is refused. Prolonged starvation is always an added danger.

Haas[8] recommends the use of ripe bananas as a valuable addition to the diet as soon as the diarrhea is controlled by the protein milk feeding. He usually starts with one banana by the end of the first week, quickly increasing by one or two daily until the patient's demand for carbohydrates is satisfied. The maximum which the child will usually take is from four to eight daily. The bananas may be considered as ripe for eating when they are a full golden yellow and brown spots have begun to appear. From this stage until they are completely brown they may be considered as proper food. They must have a bland, sweet taste, not acrid and should never pucker the mouth.

According to Pease and Rose,[9] bananas that are full golden yellow, with many small brown spots, contain 18½ per cent of sugar, in terms of glucose, and will yield 100 calories for each 100 grams consumed. Haas states that, while the anorexia causes the bananas to be refused by many children at the beginning of the treatment, sooner or later they are relished. My own experience with one, and a personal communication in a second, led me to believe that bananas are entitled to further consideration as a food addition late in the second stage of treatment.

Further Treatment. Hydrochloric acid in amounts of 1 or 2 c.c. of the dilute acid may be administered with each feeding. Iron in the form of citrate of iron and ammonia, or the lactate of iron in doses of 2 to 5 grains, is indicated. One of the organic iron compounds may be used as an alternative. In severe cases it may be necessary to give iron intramuscularly. In the presence of marked tympanitis thyroxin, grain 1/320, and the posterior lobe of the pituitary gland, grain 1/10, twice daily, seemingly at least have a tendency to overcome the atony of the bowel. The possibility of a beneficial influence through the use of insulin offers a problem for future investigation. During periods of constipation irrigation of the colon once daily with one or two quarts of 1 per cent bicarbonate of soda solution is advisable. Abdominal massage should be given twice daily. Woolen underwear and the wearing of an abdominal supporter are recommended throughout the entire course of treatment.

In my own experience ultraviolet radiation with a quartz lamp, as recommended in the treatment of rickets, has given surprising results. Transfusion with human blood has in several instances carried my patients through what seemed almost hopeless periods of their illnesses. In some the blood was injected intravenously, being repeated over several days; in others usually one intravenous transfusion was given.

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104 South Michigan Avenue.

THE POSTOPERATIVE PULMONARY ABSCESS

A DISCUSSION OF ITS ETIOLOGY AND TREATMENT*

EMILE HOLMAN, M.D.
SAN FRANCISCO, CALIF.

Professor of Surgery
Stanford University Medical School

The prevailing opinion of clinicians in the general and special fields of surgery regarding the etiology of the postoperative pulmonary abscess is perhaps best expressed in the following statement by Hedblom:[1] "From the standpoint of etiology, two facts seem definitely established, first, that the great majority of pulmonary complications following tonsillectomy are due to aspiration infection, and second, that the great majority of them followed operation under general anesthesia." Only a few writers dissent from this point of view,[2] and their case is perhaps best presented by Fisher and Cohen[3] who say: "When it is remembered that the tonsil in the adult is almost always reeking with bacteria, liberated and perhaps forced into the circulation during an operation on the tonsil, and that the field of operation can never be considered surgically clean, it would appear that infection through the circulation is the most likely and probable way in which a lung abscess occurs." It is apparent from these widely divergent views, that the clinical evidence pertaining to this subject is sufficiently diverse as to make it available for whatever opinion a given writer may wish to emphasize.

Experimentally, however, the evidence is more precise. Aschner[4] in 1922 referred to numerous unsuccessful attempts to produce pulmonary suppuration by introducing infected material of many different varieties into the bronchial tree. Numerous other investigators in attacking the problem from the point of view expressed by Hedblom have failed also. In 1919, under the direction of Dr. Geo. Heuer, I attempted to produce pulmonary abscesses by placing infected bullets directly into the lung tissue by thoracotomy. One small abscess was produced in about ten attempts. Similarly Crowe and Scarff[5] of Johns Hopkins, employing many ingenious methods including the introduction of septic foreign bodies into the bronchus, were unable to produce a pulmonary abscess. Lambert and Miller[6] of New York attempted to produce pulmonary lesions in monkeys by the intratracheal injection of anerobic organisms, in conjunction with

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* Read before the Fifty-second Annual Meeting of Oregon State Medical Society, Portland, Ore., April 1-3, 1926.

tonsillectomy, but no lesions occurred. They consider anærobic organisms essential constituents of the bacterial flora of a pulmonary abscess.

In 1925, working with Weidlein and Schleuter, we were unable in eleven attempts to produce a pulmonary abscess by introducing infected foreign bodies directly into the bronchial tree.[7] It is evident, therefore, that experimentally, the adherents of the aspiration theory have failed to obtain any support.

In contrast to these results are those obtained by utilizing a septic embolus introduced into the circulation through the jugular vein.[8] In fifteen out of twenty-one attempts definite pulmonary abscesses were produced by this method at the laboratory of Surgical Research of Western Reserve University. Continuing the work in the Stanford Laboratory, Dr. L. Chandler and I have been able in ten out of twelve attempts to produce a pulmonary abscess by this method, with fatal results in four instances. Two of the animals, H-1 and H-2, furnished some very instructive information. Both animals were treated identically, each receiving into the jugular vessel a small segment of femoral vein filled with an emulsion of streptococcus hemolyticus, staphylococcus aureus and bacillus coli. H-1 recovered completely, and exhibited no roentgenographic evidence of an abscess, but when the lobe was removed thirty-five days later, a very small abscess was discovered. H-2 died on the thirteenth day, presumably from a blood stream infection with a well developed pulmonary abscess present. It is instructive that of two animals, each receiving identically infected emboli, one survives and recovers completely with only a minute abscess around the embolus, and the other succumbs with a well defined abscess present.

The development of an abscess in these experimental animals parallels closely the clinical picture presented by the postoperative pulmonary abscess. It was found that the first evidence of a pulmonary abscess in the experimental animal appeared about the fourth to sixth day. Clinically, in a study by Moore,[9] the average time of onset of symptoms in 187 cases of pulmonary abscess, following operations under general anesthesia, was on the sixth day. Moreover, the average time of onset of symptoms in thirty-four abscesses, following operations performed under local anesthesia, was also on the sixth day. This close parallelism between the average time of onset of symptoms in the clinical cases and the sequence of events in the experimental production of a pulmonary abscess is striking and significant, and the inference may be made that the process is dependent in both instances upon the same factor, namely, the presence of infected emboli in the blood stream.

If, according to certain authors, the aspiration of infected blood and mucus is so important in the etiology of pulmonary suppuration why, we may ask, is the aspiration of obviously infected foreign bodies so rarely followed by the development of the characteristic intrapulmonary abscess with its large amount of foul sputum? Chevalier Jackson[10] in a recent article has called attention to this rather startling fact. Metallic and organic foreign bodies which had resided in the bronchi for incredibly long periods of time, over forty years in one instance, with putrefactive processes going on about them, had failed to produce at the time of their final extraction any of the characteristic signs and symptoms of intrapulmonary suppuration. Immediate recovery invariably followed the removal of the offending and offensive intruder.

Both clinically and experimentally, therefore, there is little evidence to support the view that intrapulmonary abscesses are in most instances the result of the aspiration of infected material. The positive experimental evidence available, showing that such abscesses can be uniformly produced by the introduction of septic emboli into the blood stream, suggests that the postoperative abscesses seen clinically are in great number due to infected emboli from the operative field.

The treatment of pulmonary suppuration continues to be one of the most baffling problems confronting the thoracic surgeon of today. There are a variety of possible lines of attack, and it must be emphasized that no one form of treatment is applicable to all cases.

Expectant treatment is indicated during an associated pneumonia, and in the incipient stage of the abscess in all cases. Lambert and Miller report a remarkable improvement in their results following recognition of the fact that *medical* not surgical care of the patient is the *first* requisite following the discovery of an abscess. Expectant treatment is also indicated in all cases in which there is progressive improvement, and in which patients do not become steadily worse during the initial period of from one to two months. It seems a good rule, if the abscess communicates with a bronchus permitting postural drainage, to postpone operative interference for at least six to eight weeks after the discovery of the abscess.

During this time very conscientious efforts should be made to secure repeated and complete evacuations of the cavity by postural drainage, the number of such evacuations being governed largely by the rapidity with which the cavity fills with pus. An effort should be made to prevent any distension of the cavity by complete filling. Certain writers recommend postural drainage whenever the patient feels the necessity of draining through a desire to cough. It would seem more logical to drain at regular intervals as often as every hour during the day, if necessary, *before* such stimulus occurs. After a few days of observation as to the rapidity with which the cavity fills, a regular regime should be instituted which entails postural drainage at somewhat more frequent intervals than the time required for the cavity to fill. An essential part of this expectant treatment is forced feeding, exposure to direct sunlight and complete rest.

In the absence of a communication with the bronchus such expectant treatment is manifestly ill advised. The following instance illustrates this well:

A patient developed a high fever three weeks after cholecystectomy and ten days after the subsidence of fever, due to a frank postoperative bronchopneumonia. The physical signs were those of empyema of the lower half of the right thoracic cavity. Aspiration evacuated a thin foul smelling pus. An x-ray examination then revealed an intrapulmonary cavity with a distinct fluid level. The patient was coughing up a tenacious thick purulent material which was not foul smelling and which had none of the physical characteristics of the pus obtained by aspiration. The eighth and ninth ribs were resected and about 200 c.c. of thin, foul-smelling pus were obtained from an intrapulmonary cavity. The patient made a complete recovery.

If the patient with an acute abscess shows a continuous downward trend during these few weeks of postural drainage and expectant treatment, or if there are no unmistakable signs of improvement, such as diminution in cough and sputum, an increased appetite, and improvement in the feeling of well-being, it is obvious that some other procedure is indicated to avoid irreparable damage to the lung. In centrally located abscesses near the hilus, one is justified in attempting collapse of the cavity by artificial pneumothorax. The presence of pleural adhesions in 40 to 50 per cent of the cases will always limit the applicability of such a procedure. There is real danger in attempting collapse in the presence of a peripherally located abscess which is usually adherent to the parietal pleura. Under such circumstances, collapse would in all likelihood cause the abscess to rupture into the pleural cavity, a very grave complication of pulmonary suppuration. I recall such a catastrophe in a young nurse who had a tonsillectomy performed under local anesthesia. This was followed by the development of a pulmonary abscess near the periphery of the right upper lobe. Artificial pneumothorax was followed by a complicating empyema and death.

The treatment of choice in the peripherally placed abscess, when expectant treatment with postural drainage has failed, is direct drainage. The exact location of the abscess is first determined by stereoscopic roentgenograms and by physical findings. The overlying rib is resected without, however, incising the parietal pleura. If the pleura is grey and thickened, it is quite likely that the visceral and parietal pleuræ are adherent, and after exploratory needling the abscess should be entered with a cautery and drained. Dependent drainage should be obtained if possible by resecting the proper number of ribs, as determined from direct inspection of the cavity. It is further advisable to remove all ribs directly overlying the cavity to permit at least partial collapse of the chest wall. If perchance the visceral and parietal pleuræ are not adherent, as disclosed by the movements of the lung within the parietal pleura, it is quite essential first to obtain such adherence by applying a large gauze pack against the parietal pleura and displacing it inwardly. There is no need at this time of incising the parietal pleura. Prompt union between the two pleuræ occurs, and within five to eight days the lung may be incised and the abscess drained.

Occasionally it is possible to strip free the parietal pleura, palpate the lung over a considerable area and thus determine the exact seat of the abscess. With a few stitches this part of the lung is applied to the thoracic wall, resecting additional ribs if necessary to be able later to enter the cavity directly. In case of doubt as to the presence of adhesions between the parietal and visceral pleuræ, one should proceed as though no adhesions were present, and postpone opening the abscess until a later date.

It is often advisable to postpone opening the abscess even in the presence of such adhesions. Let me illustrate.

A young man entered the hospital with all the signs and symptoms of an upper lobe abscess following pneumonia. Resection of the second and third ribs anteriorly was performed under local anesthesia. (It is decidedly preferable and always advisable to carry out any operative procedure on pulmonary abscesses under local anesthesia.) At the end of the resection of the two ribs the patient had become restless and his pulse rate was constantly around 140 to 150.

Opening an abscess, with the almost invariable establishment of a bronchial fistula, frequently results in an excessive acceleration of the pulse rate. With this possibility in mind, opening the abscess at that moment was considered unwise and accordingly the incision into the pulmonary tssue was postponed for twenty-four hours, when the abscess was drained with greater safety. The patient proceeded to a complete and uneventful recovery.

The point of attack for drainage depends largely on the signs of its location, choosing the spot where it appears nearer the surface and where adhesions are most likely to be present. If situated in the upper lobe, an anterior incision gives the best exposure. If situated in the lower lobe, a lateral or posterolateral incision is usually the best.

In the presence of a chronic abscess with thickened walls, it may be found that the collapse of the cavity is impossible by expansion of the intrapulmonary tissue. In such an event, obliteration of the abscess cavity can only be obtained by extrapleural collapse of the chest wall. This necessitates the resection of from three to six ribs over the region of the abscess.

Complete extirpation of the diseased pulmonary tissue by lobectomy is theoretically the ideal treatment, but a mortality of 52 per cent in the 48 reported cases makes such a procedure quite prohibitive.

The cautery pneumectomy of Graham[11] offers some hope in the chronic, diffuse suppuration. In the presence of a single abscess such a procedure is unnecessarily drastic, and attended by the serious dangers of hemorrhage and cerebral emboli. In the presence of multiple abscesses and extensive pneumonitis, it is perhaps the procedure of choice.

Bronchoscopic drainage is receiving considerable attention at present, but in view of the numerous spontaneous cures of pulmonary abscesses, it is difficult to determine its precise value in the treatment of the acute abscess. At best it can be employed but twice weekly and usually only once weekly. Such drainage seems much less adequate than can be obtained by postural treatment. It is of distinct value when granulations obstruct the bronchial lumen and prevent adequate evacuation of the cavity by postural drainage.

Many workers, notably Lambert, Miller and Hedblom, have emphasized the importance of a comparatively early operative treatment of these abscesses before their walls become rigid, and before an extensive pneumonitis surrounding the abscess has developed. Hedblom found that in 30 acute cases there was a mortality of 33 per cent. In 17 chronic cases the mortality was 47 per cent. Similar observations were made by Lambert and Miller. In the untreated case there also remains the constant threat of a complicating meningitis and brain abscess. Tuffier found that 25 per cent of the cases of pulmonary suppuration died of a meningitis.

Our greatest interest, of course, should be in the prophylaxis which may prevent the apparently increasing incidence of pulmonary suppuration. Certain authors have laid down rules which they consider of prime importance. Chipman[12] says, with reference to tonsillectomy, "A patient should not be operated upon within seven days after an attack of tonsillitis or when there is an acute bronchitis. The patient should be in the hospital twenty-four hours before operation. The mouth and teeth should be thoroughly cleaned before operation with an antiseptic solution. The tonsils and pharynx should be painted before operation with 50 per cent tincture of iodine, and the cavity should be swabbed with iodine after removal of the tonsils. All bleeding to be stopped at once. All precautions against aspiration should be taken both during and after the operation."

Fisher and Cohen, who emphatically believe in the embolic theory of the origin of lung suppuration, also believe that the general anesthetic is one of the most important contributing factors in the causation of this complication and advocate the exclusive use of local anesthesia. This, they say, produces a marked constriction of the lymph and blood channels in the field of operation, and prevents the introduction into the circulation of infective emboli.

Hedblom says: "So common is the sequence of cold, pharyngitis or tonsillitis, and postoperative pulmonary complications that it is a universal rule at the Mayo Clinic to postpone operations in all such cases, unless immediate operation is urgently indicated." Fetterolf and Fox, whose excellent studies furnished the first experimental evidence in favor of the embolic theory of pulmonary suppuration, advise against any transfixion ligatures likely to carry infection more deeply into the tissues and thus precipitate thrombosis of the paratonsillar veins.

Since this pulmonary complication quite frequently follows other operations in a septic field such as appendectomy, pelvic operations, and gastric resections, it is well to reemphasize the great virtue of careful and delicate handling of all tissues. By an adequate protection of the abdominal wall tissues—particularly the muscle and fatty layers—against infection, by the avoidance of undue trauma through careless and unnecessarily vigorous retraction, we may diminish greatly the ever present risk of thrombus formation, or dislodgment of already existing infected thrombi. Surgeons will do well ever to remember that surgery is a *gentle* art, which deals with the most delicate of all known substances—the living cell—and that the utmost care is demanded in any procedure which aims to preserve its viability or its normal existence. In the prevention of postoperative pulmonary suppuration gentleness and delicacy are perhaps the most important requisites in any procedure which entails the handling of infected or potentially infected tissues, primarily because of the danger of thrombus formation or of the dislodgment of infected thrombi already present.

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PULMONARY ABSCESS*

CHARLES R. CASTLEN, M.D.
SEATTLE, WASH.

Pulmonary abscess is usually secondary to some primary inflammation of the lung tissue as the result of extension of septic material, or infection from an adjoining organ as cancer of the esophagus or abscess of the liver, general pyemic process or direct aspiration of septic emboli, following operations on the upper respiratory tract, such as tonsillectomy or removal of teeth. They may be single or multiple.

Traumatic causes are such as pulmonary injury from fractured ribs, gunshot or stab wounds or aspiration of foreign body, such as a tack or a tooth.

Hedbloom[1] reports 692 cases from the Mayo Clinic, showing 146 postoperative cases, with 31 posttonsillectomy cases (operations having been performed elsewhere), 14 following teeth extractions and 38 following laparotomy. The majority of the postoperative abscess cases were aspiration cases and these following general anesthesia.

Wessler[2] reports 26 cases following upper respiratory tract operations particularly tonsillectomy, 21 of these being sequelæ of tonsil operations. J. Homans[3] reports 13 out of 23 lung abscesses being postoperative.

The size of the abscess varies from the size of a marble to 10-13 cm. in diameter and usually round in shape. There is present an inflammatory reaction, the abscess reddish grayish or reddish yellow, containing thick or bloody stained pus. In recent cases where evacuated, it soon clears up and only fibrous strands are left. Others of a chronic nature show intense surrounding fibrosis. Large abscesses clear up quite as quickly as smaller ones do.

The abscess may terminate by rupture into a bronchus and empty itself. If drainage is adequate, it will heal up unless the cavity is very large. Again, the abscess may rupture through pleura, producing a pyopneumothorax. During the influenza epidemic there were many such cases with localized extrapulmonary or interlobar fissure abscesses. The abscesses may become chronic and cause extensive fibroid changes.

With the etiologic factors named above and in a patient developing respiratory symptoms or else with an exaggeration of the pulmonary symptoms already present, pulmonary abscess is to be thought of, especially in postoperative cases, particularly tonsillectomy. With the onset of intermittent fever, chills, sweating, high leucocyte count, cough with some expectoration, blood-streaked sputum or definite hemorrhage and pain where the pleura be involved, pulmonary abscess may be suspected. Death may occur at times from severe hemorrhage. In pneumonia cases often these symptoms are present, but if the fever persists and is intermittent with chills and sweats, or if these develop after decline of symptoms in a pneumonia case, abscess should be thought of. In any suspected case radiograph should be made. Pulmonary abscess is seen oftener in the postmortem room than at the bedside. Tangent x-ray or fluoroscopy is often of more value than anteroposterior pictures.

The diagnosis is rarely made prior to or in the absence of expectoration of large quantity of purulent sputum. This is most characteristic. The sputum is thick, ropy, pale yellow, bloody or greenish in color. Odorless or sweetish or very foul and with often repeated outpourings. This may become less and less or, if not drained, will persist with worse odor and more severe symptoms of chronic suppuration and the sputum becomes fetid. The amount of sputum varies from a small quantity up to a pint or more in twenty-four hours. The sputum is negative for tubercle bacilli but elastic fibers and lung tissue may be found. Evidence of necrotic or gangrenous changes may occur in sputum on thirteenth or fourteenth day, following operations of the respiratory tract, although sometimes this may occur later. At times a chronic lung condition with negative sputum lasting for months, with slight symptoms and diagnosed only by x-ray, may exist. If present with other pulmonary inflammation, the physical signs may be masked and at times there may be a pleural exudate obscuring signs.

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Distinctive features are cavity signs, tympany on percussion, whispering pectoriloquy, amphoric or cavernous breathing and moist rales of various sizes. These signs may not all be present, depending on location of abscess whether empty or not. In most abscesses deeply placed, the signs of excavation are often wanting. Cavity signs are present, however, in about 25 per cent of cases and are usually heard at the angle of the scapula. If at apex, sputum examination may clear up the possibility of pulmonary tuberculosis. Dull percussion note, increased tactile fremitus, distant bronchial or bronchovesicular breathing and fine crepitant rales, usually are manifest. Clubbing of fingers develops usually more or less rapidly. The internist and surgeon should be associated in all lung abscesses and border line cases. The mortality is 50 per cent when treated medically and 25 per cent surgically (Norris-Landis[4]).

Lung abscess has acute symptoms as a rule, whereas the chronic nature of tuberculosis and bronchiectasis may help to differentiate. Repeated negative sputum in long standing cases suggests pulmonary abscess and will help to rule out tuberculosis.

The diagnosis of multiple abscesses is harder than cases with only one abscess present. Their presence is suspected in cases of general septicemia with respiratory symptoms or in croupous or bronchopneumonia cases in which the hectic type of temperature with chills and sweats follow. Physical signs are present in both lungs with no localizing signs. Tuberculosis and mycotic infections should be considered. The patient rarely lives long enough to develop fibrosis. Suppurative foci of diverse kinds at distant parts of body play an important part, as in mastoid disease and thrombosis of jugular or lateral sinus, otitis media with or without thrombosis. Thrombosis of the portal vein and mesenteric veins, appendicitis, pneumonia, vegetative endocarditis or typhoid abscesses elsewhere may be in the background.

Graham[5] reports in the literature forty-eight cases of chronic lung suppuration treated by lobectomy with operative mortality of 52 per cent. The actual cautery is used in burning out diseased areas with favorable results.

Whittemore[6] reports 86 cases in six years. Lockwood[11] says 7 per cent recover spontaneously. Lord reports 9 per cent operative mortality on 62 cases. This is the lowest mortality reported. In the series of 86 cases of Whittemore[6] 15 per cent mortality is given. Single stage operations will develop 50 per cent empyemas. If an abscess is opened, a rush of foul air and pus through tube at once or within twenty-four hours will occur.

If abscess case is not improved in three to four weeks, it should be operated on. Results are far better if one does not wait until it becomes chronic.

Meyers[7] uses the bronchoscopic treatment with repeated suction aspiration with intrabronchial medication. If this fails, pneumothorax is tried. In bronchiectatic lung abscess lobectomy is done. Lung lip fistula is a conservative operation.

Singer and Graham[8] report 24 per cent of abscesses following tonsillectomy in 34 cases. Sluder is quoted for 20,000 tonsil operations under nitrous oxide with no lung abscess and Lockwood[11] records 25,000 cases at the Mayo Clinic with but one abscess and that in association with a general septicemia. Singer and Graham[8] recommend a diagnostic pneumothorax to determine presence of adhesions before puncturing lung. At the site of adhesions thoracotomy is done and exploratory aspiration is made. They try medical treatment, postural drainage and bronchoscopy prior to operation. Pneumothorax is used chiefly for diagnosis but occasional recovery is made. Forty-six per cent mortality in 13 operative cases is given.

Lockwood's[11] 1922 series of 27 cases showed a mortality of 41 per cent, and in his collected report 34.6 per cent of all cases treated surgically. With medical and pneumothorax treatment there was a 16 per cent mortality. Under medical treatment alone there is a mortality of 58 per cent.

Kinghorn and Meyers[9] treat bronchiectatic lung abscesses with bronchoscopic aspiration and gentle irrigation or pneumotomy with drainage or radical lobectomy with a 50 per cent mortality. In some cases extrapleural thoracoplasty is made. Incision and prolonged drainage is a more conservative operative procedure.

Rich[10] reports 20 cases treated by artificial pneumothorax by him and Tewksbury, in which 80 per cent completely and promptly recovered.

Hedbloom[1] recommends expectant treatment during associated pneumonias and in the incipient stage of the abscess in all cases, also where there is progressive improvement and in the multiple and widespread abscesses. Pneumothorax, extrapleural thoracoplasty, thoracotomy and lobectomy are the operative procedures.

In this series of twenty-five cases being reported, seven followed tonsillectomy. Of these three had a general anesthetic; one followed tooth extraction with gas oxygen anesthetic. Twelve cases followed pneumonia or so-called "flu," being likely undiagnosed pneumonias. In five cases the cause was not determined and of these, four died, one of these being an old chronic upper lobe abscess which eventually ruptured through bronchus with a fatal hemorrhage in a patient who had refused operation. The second fatal case died on the twelfth operative day from embolis. The third died on the fifth day after operation, unable to rally from operation. This case was in a most desperate condition at the time of the operation.

Of the other cases ten were operated upon. All of these were treated by thoractomy with open drainage except two, in whom extrapleural pneumolysis was done. Two cases treated expectantly, one of right upper and one right middle lobe, healed spontaneously. Eleven cases were treated with artificial pneumothorax, of whom one recovered in six weeks. Six on account of dense adhesions were unable to receive satisfactory collapse and consequently were operated upon, and the remaining four have recovered.

In all of these cases, where the pneumothorax was done and which were subsequently operated upon, this procedure has been of great help in localizing the abscess. One pneumothorax case developed a serous pleurisy following an influenzal attack, and the pressure of fluid ruptured the abscess into the pleural space. This case was operated upon immediately following aspiration which showed the presence of pus in the pleura. This pus was swarming with streptococci. This case died in twenty-four hours following operation. Another operative case showed serous effusion in the pleural space overlying the abscess, yet aspiration had definitely showed foul smelling pus in the abscess. This case on the way to the surgery had a hard coughing spell. The abscess ruptured into the bronchus and the patient nearly strangled to death.

Three of these cases complicated with bronchiectasis have been treated by bronchoscopic aspiration and irrigation and have shown some improvement. One case on exploratory puncture showed thick, foul-smelling pus in the abscess. The rib was resected with discharge of only serous effusion, evidently overlying the abscess. Inasmuch as the pocket was small and the lung fixed with adhesions, a tube was inserted and left in situ. The following day there was a large discharge of pus through the tube which continued until the abscess had healed.

SUMMARY

1. It would seem that no two abscesses can be treated in the same manner or that the results will be at all similar. Perhaps the first most important point is the localization and determination of the type of abscess and the presence or absence of dense adhesions.

2. If postural drainage by elevation of foot of bed or hips or use of a special table and frequent emptying of cavity fail, then pneumothorax both as a diagnostic and therapeutic measure for localization, determination of type of operative measures to be considered or the expression by pressure of the septic material through the bronchi may be used. In the event this fails on account of adhesions and dense fibrosis, or only partial collapse can be obtained, bronchoscopy with suction aspiration or injections of lipoidal or irrigation may be tried.

3. Following the failure of these measures, recourse must be taken to surgery. The best results we have seen have been in the two stage open operation, by first fixing the visceral pleura to the chest wall, and after adhesions have formed, opening the abscess either with cautery or aspiration or tube drainage and continuing drainage until the abscess cavity is completely obliterated. Extrapleural operations, as partial thoracoplastic resection, have been used in some of these cases and, while at times the results have been most gratifying, in one case recourse had to be made to open drainage at a later date.

4. We certainly cannot expect much from medical or too long continued expectant treatment and, while one case healed up with only general medical nursing care, the abscess was so located in the right upper lobe that after rupture drainage was very simple through the upper lobe bronchus.

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804 Cobb Bldg.

SURGICAL TREATMENT OF LUNG ABSCESS*

WITH REPORT OF CASES

T. W. Buschmann, M.D.
SEATTLE, WASH.

Bronchoscopy. Yankauer reports in a recent article (*Surg. Clin. N. A.*) 50 per cent improved, 20 per cent cured from this method of treatment. These figures are far higher than quoted by most authorities who cite only an occasional cure by this procedure. He states that some cases require eight to twelve months of irrigation.

Lukens in February, 1925, reported a case of cure of abscess involving external branch of the right lower lobe bronchus by weekly aspirations and injection of 5 c.c. of 5 per cent gomenol in mineral oil. Whittemore *S. G. & O.*, 1924, p. 46) states that bronchoscopy may cure a very limited number of cases due to foreign bodies when used early, but states it is of doubtful value in long standing cases. Lord (*Bost. Med. and Surg. Jour.*, April 25, 1925) states that improvement in local drainage by bronchoscopy, aspiration and lavage may be considered in deep-seated abscesses near the root of the lung, if skilled operators are available. There is great danger of infecting the healthy lung in this method of treatment.

We would conclude from these notations that the bronchoscope should be tried only in those early cases of lung abscess situated at the root of the lung and due to the inspiration of foreign body, if a skilled bronchoscopist is available.

Collapse of the Lung by the Production of Artificial Pneumothorax. This form of treatment can be completely executed only in the absence of adhesions between the visceral and parietal pleura. Murphy in 1898 first stated that collapse therapy by injection of nitrogen gas into the pleural cavity should be used for abscesses communicating with a bronchus, in the absence of pleural adhesions. These, however, are usually present after an abscess has existed for from six to eight weeks, especially if it is superficial. This method will then be of no avail. (Greer. *Minn. Med.*, Feb., 1925.)

Artificial pneumothorax is dangerous even in the absence of pleural adhesions, if the abscess is located close to the periphery of the lung, on account of the danger of rupture into the pleural cavity. (Rich. *Radiology*, Dec., 1924, p. 472.) To attempt pneumothorax collapse in cases of abscess impinging on the parietal pleura is irrational and dangerous. For in these cases, the drainage into the bronchus being incomplete, even though there is sufficient freedom from adhesions to allow the lung to collapse, there is a very great risk of rupture into the pleural cavity. The nearest and most direct outlet here is through the chest wall. (Hedbloom. *J. A. M. A.*, 1924, p. 1579.)

Centrally placed abscesses without pleural involvement, as indicated by lack of pain and by physical and x-ray examination, may be regarded as the most favorable type for artificial pneumothorax. (Lord. *Bost. Med. and Surg. Jour.*, April, 1925.) Three hundred to 500 c.c. of filtered air injected at three day intervals is sufficient in selected cases to collapse the lung, especially in centrally located abscesses.

We conclude, therefore, that artificial pneumothorax should be attempted only in early cases which have not existed long enough to produce a dense wall of pneumonic infiltration about the abscess cavity. For when such infiltration has taken place, even though the rest of the lung may collapse, it is impossible to collapse the abscess cavity itself. It has its greatest usefulness in early abscesses centrally situated at the lung root.

Drainage of the Abscess from the Outside. This method is particularly applicable to abscesses situated in the periphery of the lung field. In this situation thoracotomy is the most direct and possibly the most logical method of drainage. This is particularly to be selected in preference to artificial pneumothorax, if the abscess impinges on the pleura, for in these cases rupture with consequent empyema would probably take place if pneumothorax were attempted. Operation performed without adhesions usually results in empyema, a complication with high mortality. If such adhesions are not present as a result of the simultaneous involvement of the lung surrounding the abscess cavity, it is, therefore, necessary to create them artificially, preferably by a two stage operation, in which two or three ribs are resected and the visceral and parietal pleura are stitched together, or by packing the wound with iodoform gauze, giving essentially the same result. Unfortunately, bronchial fistula follows a comparatively large percentage of these cases, which in many instances is almost as distressing as the original condition itself.

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* Read before King County Medical Society, Seattle, Wash., March 8, 1926.

Thoracoplasty. This consists of resection under paravertebral anesthesia of the whole length of the ribs over the affected portion of the lung. It may be done in one operation or in stages, as indicated by the condition of the patient. The advantages of this form of treatment over pneumothorax are that permanent collapse can be secured in the presence of pleural adhesions, and it is applicable to chronic cases when artificial pneumothorax is not applicable. It is also applicable to some cases of bronchiectasis, and to cases in which extensive pleuritis makes localization of the abscess impossible. As compared with open thoracotomy drainage, it is relatively more useful in deep-seated lesions.

Lobectomy or Removal of the Affected Lobe of the Lung. This should be done after the preliminary establishment of adhesions between visceral and parietal pleura after rib resection. Cautery excision is most satisfactory from the standpoint of infection. (Graham. *Med. Jour. and Rec.,* 1925, p. 20.) Mortality following this operation varies from 50 to 70 per cent and, therefore, should only be attempted, if the more conservative methods of treatment have been exhausted. There are cases, however, which require this form of treatment. Many cases of lung abscess are multiple from the beginning, especially those following tonsillectomy. In other cases secondary abscesses develop from the primary one. These are usually associated with extensive pneumonitis, fibrous thickening and even gangrene, making collapse and drainage ineffective. For these cases cautery excision offers practically the only prospect of cure.

Extrapleural Pneumolysis. This is the method we have used in our cases. I have found practically no reference in the English literature to this method of treatment and very little in the foreign literature. It consists of the production of an extrapleural pneumothorax by the separation of the visceral pleura, parietal pleura and involved lung en masse from the thoracic cage. This is done through the line of cleavage of the endothoracic fascia. This method is mentioned in the German system of surgery by Bier, Braun and Kummell, in which it is advocated by Jesson as preferable to thoracoplasty for tuberculous cavities.

In the method described, which had been in use for only a comparatively short time, drainage was secured by the use of a large rubber tube which was inserted to the bottom of the space created by operation for a period of two days. Thereafter the cavity was simply mopped out daily with an antiseptic solution. It is his contention that the creation of a state of barometric pressure outside of the lung equal to that in the trachea is sufficient to keep the lung in a state of collapse until healing occurs. This is undoubtedly true, where one is dealing with normal lung tissue as in very early cases of lung abscess. But in cases of chronic abscess we are dealing with a rigid, unyielding tissue, the result of long standing pneumonitis. In order to compress the cavity in these cases, therefore, more than atmospheric pressure is required. Sufficient pressure must be exerted to overcome the rigidity of the abscess wall, and this pressure must be maintained until resolution of the wall has taken place and the abscess cavity healed. We use a tamponade of gauze and have by this means kept the abscess in a state of collapse. This gauze has been changed daily since the day of operation.

I would like to emphasize that it is not necessary to have adhesions between the visceral and parietal pleura in order to successfully carry out this procedure, although adhesions with an infiltrated lung do facilitate the cleavage very materially. In one of our cases no adhesions were present and in carrying out the dissection of the pleura from the chest wall a small opening was accidentally made in the parietal pleura. This, however, was immediately sewed up and the case progressed just as satisfactorily as those in which this accident did not occur.

In conclusion I would state that in the hands of such operators as Tuffier (23 cases), Murphy (98 cases), Garre (182 cases), Hedbloom (54 cases), Lockwood (77 cases), Whittemore (77 cases), the operative mortality ranges from 15 to 35 per cent. Peripheral abscesses give better results than those centrally situated. Seventy to 80 per cent, therefore, are cured or permanently benefited by surgical treatment; 10 to 20 per cent are cured by expectant treatment.

The complications to which the patient is exposed from too long delayed surgical treatment are extension of the suppurative process to nearby or remote portions of the lung, the development of pneumonia, empyema, cerebral abscess or septicemia. Medical treatment should be given an initial trial on account of the dangers incident to radical surgery. Postural treatment may be tried with abscesses of less than two months standing. Unless there is definite and early evidence of improvement, radical operation should be advised.

CASE REPORTS

Case 1. J. S., age 31, male, single, Italian. Father and mother, five brothers and two sisters living and well. No history of cancer, tuberculosis, mental or metabolic diseases in family.

Diseases of childhood: Measles and chickenpox. Diseases of adult life: influenza 1918, mild attack. Operations: tonsillectomy September 8, 1923. Four days following tonsillectomy patient commenced to bring up a foul smelling purulent sputum. Between time of removal of tonsils and commencement of expectoration he experienced a constant sense of uneasiness.

Ever since he has suffered from the following symptoms: Profuse expectoration at frequent intervals day and night, the intervals usually being about half an hour. Septic temperature reaching 103°, rapid pulse up to 155, respirations up to 45 and 50. Occasionally after spell of coughing would bring up a little blood. Dyspnea on slight exertion. Very profuse sweating associated with chills and temperature. Continuous exhaustion. Insomnia. Has lost 20 lb. in weight. Appetite very poor and gradually reduced till he was not able to take milk, and could take only broth. Bowels regular. No headaches, no special sense symptoms. Has had casts and albumin in urine off and on since tonsillectomy.

General appearance pale and acutely ill. Strained expression, eyes bulging, rather nervous. Neck negative. No adenopathy. Height 5 ft. 6 in. Normal weight 172 lb., present weight 158 lb. Chest well formed. Respiratory movements restricted on right side. Impaired resonance over upper lobe extending to third rib. Loud coarse sonorous rales heard over right upper lobe posteriorly and anteriorly. Increased fremitus over upper right lobe.

X-ray showed dense impenetrable mass first to second interspace right side. Haziness involving entire upper lobe to third rib. Abdominal examination negative. Extremities negative. Genitourinary negative. Sputum on many occasions showed many pus cells, few streptococci and few pneumococci.

Feb. 16. Hbg. 80 per cent; R. b. c. 3,800,000; W. b. c. 11,600, Large lymph. 20, polys. 80. Feb. 27. Hbg. 80 per cent; R. b. c. 4,000,000. W. b. c. 11,200. Large lymph. 20, polys. 80.

In view of x-ray findings, cavity upper right lobe and clinical findings: expectoration in large quantities, 12-15 oz. of foul smelling sputum day and night. mostly in the morning; disturbance day and night; loss of appetite, unable to eat anything except small quantities of milk and broth; loss of weight (20 lb.) and strength, diagnosis of lung abscess was made. Artificial pneumothorax had been performed but was not followed by any improvement in symptoms, evidently because of dense adhesions in upper right lobe, preventing collapse of this portion of the lung. In view of the history and findings which appeared, if permitted to continue, would terminate fatally, operation was advised.

Operation findings: Abscess 6 x 7 cm. in diameter in upper right lobe, reaching from second to fifth rib. Entire upper lobe of surrounding lung had the consistency of liver. Operation performed: Resection of second and third rib, four inches of each. Extraplural pneumolysis of entire upper lobe. Iodoform gauze packing was used to keep lung in state of compression.

Case 2. Mrs. J. M., age 33 years. Preoperative diagnosis, lung abscess.

Family history: Father died at 66 of cancer of stomach. Mother living and well. Ten brothers and one sister living and well. History of heart disease on both sides of family.

Previous medical history: Chickenpox, measles, whooping cough, grippe.

Clinical history: Patient had tonsillectomy two months prior to admission. Ever since has complained of pain in right side of chest, profuse expectoration—10 to 15 oz. in twenty-four hours—and of very foul odor. During the process of coughing and expectoration, she often vomits. Night sweats, loss of appetite and weight, having dropped from 155 to 132 lb.

Examination: Mild cyanosis. Restriction of respiratory movements of right chest. Pain on pressure over lower right chest. Physical examination of chest shows dullness from sixth rib to base of the lung anteriorly and from the sixth interspace, posteriorly. Dullness over this area and breathing is distant and of tubular type. Fremitus increased. Small moist rales heard most markedly anteriorly. X-ray examination shows shadow corresponding to this area. Leucocytes 11,200; hemoglobin 71 per cent.

After considering the clinical history, physical findings and general course, a diagnosis of lung abscess was made. Since the patient was growing progressively worse without any interval of improvement, operation was advised.

Operation. Dec. 19, 1925. Findings: Indurated area about the size of a hen's egg deeply seated at lower portion of right lung. There was no adhesion between the visceral and parietal pleura. About 8 cm. of eight and ninth ribs resected, the center of which was in the midaxillary line. The parietal pleura was separated in cleavage line of endothoracic pleura, allowing the entire lower portion of lung to collapse. A tampon of iodoform gauze was inserted. compressing lung over entire area of separation of fascia. Iodoform gauze strip in pleural cavity.

Case 3. E. E., age 7 years. Suffered from influenza November, 1925. The cough persisted ever since infection commenced and she continued to complain of headache, malaise, loss of appetite and weight, chilly sensation, occasional night sweats, shooting pains through the right chest. On January 1, 1926, a swelling appeared in the right chest which gradually increased in size and became more and more painful; no redness or other evidence of acute inflammatory reaction. Temperature 99.6°.

Leucocytes 29,000; hemoglobin 75 per cent; red cells 4,200,000. Urine showed an occasional granular cast, few pus cells and a trace of albumin.

Physical examination essentially negative except for a bulging swelling, right side of chest, between anterior and posterior axillary lines, extending from the fifth to the eight rib. This is very sensitive on palpation. There is some restriction of movement and diminution in vocal fremitus and resonance over above mentioned area. Breath sounds diminished.

The x-ray showed very little. We felt we were dealing with a postinfluenzal abscess but were uncertain as to the exact depth and extent of the process in view of the practically negative x-ray findings.

Operation: Resection of about three inches of the fifth and sixth ribs was performed. After incising the thickened pleura an abscess cavity was entered. We felt that pleural adhesions had taken place on account of the general appearance and the dense feel of the lung in immediate proximity, and did not hesitate, therefore, to proceed. A fairly large-sized abscess, involving the lung down to about one inch in depth with considerable necrotic lung tissue and thick stringy pus, was removed. Patient made an uneventful recovery so far as her operation was concerned.

Case 4. F. C. P., age 47. Family history: Father living and well. Mother died at 54, cause of death unknown. One brother died of diphtheria; two brothers died in infancy; two sisters living and well.

Previous medical history: All childhood diseases. Influenza 1918 and 1919; pneumonia 1923, 1924. April, 1925, rib resection and extensive needling of lung for abscess which was not entered.

Clinical history: Pneumonia 1923, after which time patient never gained his normal strength. Loss of 60 lb. in weight. Bronchial pneumonia October, 1924. Developed lung abscess. Right rib resection April, 1924—operation under local anesthesia. Hemorrhaged by mouth about 32 oz. during course of operation. Confined to bed six weeks, after which time patient had little or no relief. Coughs more or less almost continuously; most severe every morning. Always expectorates small quantities of dark blood when coughing. Since August, 1925, has had about twelve hemorrhages: quantity from 2 to 32 oz. October, 1925, hemorrhaged 32 oz. bright blood; January 28, 1926, similar amount. Hemorrhages spontaneous with no previous coughing spell.

In adition to above symptoms patient brings up over a pint of sputum in twenty-four hours. Complains of a soreness in right chest particularly anteriorly; loss of appetite.

Urinalysis is practically negative. Sputum: Mucosanguinous. No tubercle bacilli, many streptococci and staphylococci, few red-like bacilli, numerous red blood cells, leucocytes and a few elastic tissue shreds. Hemoglobin 69 per cent; red cells 3,890,000, leucocytes 14,500. Wassermann negative. Temperature averages 100° to 101° Pulse rate 90 to 100.

Examination: Patient is very anemic, lips and mucous membranes pallid. Diminished respiratory movements right chest. Chest is thin-walled and musculature is poor. Scar on right chest from previous operation. There is dullness in lower right chest from below the fifth rib; increased vocal and tactile fremitus; rough tubular breathing over same area with occasional moist rales. Left lung is apparently normal. X-ray shows a dense root shadow in right chest.

This patient has seen many physicians and has had some sanatorium treatment in an attempt to escape operation. He improved very markedly during two weeks treatment in the hospital. Appetite improved, gained some in weight and felt generally better. After his two weeks' stay, however, he felt that he should attend to some important business matters and asked to be discharged, although he was advised to remain. I believe since discharge, however, his condition has grown somewhat worse and that he is about convinced operation offers the only hope of a cure.

I have attempted to bring out the relative utility of the various operative procedures in the treatment of lung abscess. From what we have said you will see that the treatment or type of procedure is determined by the site of the abscess and its duration and the complicating factors of pleural adhesions and lung involvement.

LEUKODERMA SYPHILITICUM. Bedford Shelmire and Thomas J. Calhoun, Dallas, Texas (*Journal A. M. A.*, May 8, 1926), relate the histories of three patients with a generalized syphilitic macular roseala who developed, in the wake of this eruption, generalized macular leukoderma. Depigmented areas developed at the sites of the secondary syphilitic macules in from one to three weeks. The depigmented areas were not influenced by antisyphilitic treatment. The leukoderma areas disappeared as a result of repigmentation, which started at the periphery and gradually reached the center.

FLUOROSCOPIC EXAMINATION OF THE CHEST

WHAT IT MAY SHOW*

W. A. SMITH, M.D.
BELLINGHAM, WASH.

In choosing fluoroscopic examination of the chest as the subject matter for this paper I wish to emphasize the usefulness of the fluoroscope as a diagnostic agent in the study of mechanical function. By this I mean the study of diaphragms during respiration, the study of the heart and great vessels during their functional activity, and the study of the lung-fields during respiration and coughing.

On the other hand, in addition to mechanical function the fluoroscope shows shadows, the counterpart of the film, and studies may be made from this standpoint alone. As far as gross pathology is concerned, it is equally as good as a film, with the exception that the image is not as bright, is not as sharply defined, detail is not as well shown, nor is there any permanency of shadow produced for leisurely study. It is understood that the film is a negative and the screen image is a positive shadow. In other words, light shadows on the screen will show dark on the film and vice versa. This is due to a difference in the physical factors involving screen and film.

Time will not permit an exhaustive dissertation on the fluoroscope and its full value in diagnosis, and I will be unable to cover the field in a complete sense. For this reason it will be necessary to pass by many things both of interest and of value in this brief discussion.

I feel that the fluoroscope is not used as frequently as it should be in chest examination, probably from the fact that in the busy life of the doctor he finds that much he would like to do has to be neglected because of increasing demand upon his time, and possibly from the fact that perhaps he is not aware of how much valuable help he may receive from a fluoroscopic examination of the chest, nor just what pathologies the fluoroscope might reveal to him. To show this range in discoverable pathology in that chest is my purpose for the selection of this subject.

Unless one is in frequent contact with the fluoroscope in chest work and understands the physics of the x-ray, screen and film, it is not at all surprising that he should not realize the scope and possibility of such an examination. I will endeavor to confine my remarks chiefly to an enumeration of the various pathologies that may be demonstrated on the screen but not necessarily diagnosed, for I do not wish to infer that the fluoroscope alone is the best method by which to arrive at a diagnosis in some of these conditions mentioned.

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The roentgenologist or any one who works constantly with the fluoroscope in chest examination is aware of the many surprises that may be revealed to him, and of its valuable aid in general diagnosis. The writer has so often been impressed with this fact that he feels that chest fluoroscopy should be made a routine procedure in all chronic cases and in obscure acute cases where it is feasible.

A discussion of the physics of x-rays, film and fluoroscopic screen, of the roentgenologic method of studying the various pathologies that will later be mentioned and of the relative values of the film and screen in the prosecution of a diagnosis would be of both profit and interest but time will not permit.

A radiogram made of a part of the body is a demonstration on the film of the varying degrees of densities of tissues through which the rays have passed. It is evident that, if these tissues are all of the same density, the shadows cast on the film will be homogeneous and alike throughout; there will be no possibility of differentiating any of the different tissues. On the other hand, should there be interposed in these tissues a structure differing markedly in density from the other tissues, either an increase or a decrease in density, it will stand out in contrast to the other density and be readily differentiated. Therefore, we may say that, in order for diagnostic value to be achieved from any x-ray procedure, it is necessary that contrasted densities be present or be capable of being produced artificially.

Let us, then, divide radiographic methods into two distinct classes. One we may call direct radiography, wherein nature has so placed structures that contrasted densities are normally present. I might illustrate this as a radiogram made of a fractured bone or a film of the chest. The other is indirect radiography, where the structures in a part of the body are not normally endowed with contrasted densities, but the anatomic construction is such that foreign densities may be artificially introduced, thus differentiating them from the surrounding structures. The introduction of sodium bromide solution into the urinary tract, of barium sulphate into the stomach and bowels, and bismuth paste into sinuses are all examples of indirect radiography. This I term indirect because there is no visualization of pathology on screen or film, but pathology is inferred from its effect upon the artificially introduced foreign substance. This classification is introduced to bring more clearly to your minds the fact that in chest fluoroscopy and radiography we are viewing shadows of normal or pathologic viscera, and that it is unnecessary to resort to the introduction of foreign densities.

Let us review for a moment the anatomic construction of the chest as we view it on the screen. In the central portion we see the outline of the heart and aorta, composed of muscle and blood, thus producing an increased density, contrasting sharply with the lungs on either side which, due to the great amount of air contained in their cells, offer very little obstruction to the rays reaching the screen. Thus it may be seen that, if a pathology such as an inflammation, a solid tissue tumor or any pathology producing a greater density than that of a normal air-filled lung should overlie a lung-field, it would stand out more or less sharply, depending upon the difference in density between the two structures. On the other hand, should a decreased density such as a tuberculous cavity or a pneumothorax be present, it would also be evident. Therefore, at once in the study of chest pathology we may divide it into pathologies of increased and pathologies of decreased densities.

In the fluoroscopic examination of the chest the image flashed upon the screen may be viewed from two angles, one from the standpoint of motion and the other from the standpoint of immobility. I can best make my meaning clearer by the following illustration. Suppose we were examining the chest of a cadaver. The anatomic parts would be at rest and the image on the screen would be constant and immobile, like that of a film. Then suppose the cadaver should come to life and the various organs resume their functional activity; then the image would change with the movement of the organs and we could study their mechanical movement in silhouette. These two phases of the fluoroscopic examination are coexistent and because of them we are enabled to study the chest from the standpoint of mechanical function and also from that of contrasted densities, similar to that portrayed by a film.

Let us now take up the study of this subject in an anatomic manner, beginning with the diaphragm.

Diaphragm. From a functional standpoint we may study position, contour, excursion and separation. It will be necessary to consider these more or less as a whole.

Bilateral elevation of the diaphragm may be due to paralysis of the phrenic nerves or to pressure from the abdomen, such as ascites, abdominal tumors or any causation producing marked intraabdominal pressure. Localized elevation of one diaphragm may be due to eventration, subphrenic abscess, sometimes abscesses or gummas of the superior border of the liver. Tenting of the dome of the diaphragm, best observed on deep inspiration, is produced by adhesions. Obliteration of the costophrenic and cardiophrenic sinuses indicate inflammatory reaction between the coverings of the diaphragm and the pleura or pericardium. Excursion of the diaphragm is often altered by adhesions, emphysema and spasm. The latter is a reflex from acute pleurisy or possibly in some cases from acute abdominal inflammation.

In examining excursion of the diaphragm it is remarkable to note the number of people who do not employ their diaphragms properly in breathing. This is particularly true with women of the asthenic habitus. Some one has called the diaphragm the abdominal heart and its influence upon abdominal circulation, both of the large vessels and also the capillary circulation in the various abdominal viscera is unquestioned.

Before leaving the discussion of the diaphragm I wish to mention diaphragmatic hernia. While this condition is not best diagnosed by the fluoroscope without the barium meal, I have been able to suspect by the fluoroscope alone diaphragmatic hernia in a large percentage of the cases I have had.

Mediastinum. The outstanding feature of the mediastinum is the heart and great vessels. In the heart we may study position, size, contour, rate, rhythm, muscular contractility, coordination of action between auricles and ventricles. We may judge as to dilatation and hypertrophy of the heart as a whole or of the individual chambers. Organic valvular diseases are often suggested and diagnosed by the fluoroscope. Aneurism of the heart muscle is a rarity.

Adhesive pericarditis and pericarditis with effusion show their respective roentgenologic findings. With the great vessels aneurism, atheroma and aortitis show their characteristic changes.

In considering the pathologies of the other contents of the mediastinum more or less demonstrable by the fluoroscope, we may mention malignancies, primary and secondary, various chronic specific inflammation of the lymphatic glands, enlarged thymus and occasionally abscess from Pott's disease of the spine and abscess of any of the mediastinal structures encroaching upon the lung-fields or displacing any of the mediastinal contents.

Lung-Fields. It is here that differentiating by x-ray methods reaches its highest degree of excellence in demonstrating the various pathologies, many of which findings are pathognomic. This is because of the high degree of contrast developed from the large amount of air contained within the air cells. In the acute inflammations we may mention lobar and bronchial pneumonia, interlobar accumulations of fluid and abscess of the lungs. Foreign bodies when metallic are directly demonstrated. When not of themselves visible to the x-ray, inference as to their location may be gained by the disturbance in illumination of the lung-fields.

In the chronic pulmonary conditions the list is a long one and without being too tedious, I might mention chronic bronchitis, bronchiectasis, pneumoconiosis, tuberculosis, pneumonia, various chronic infections of rare occurrence, and the various benign tumors, primary and secondary malignancies, and intrathoracic thyroid gland. The hili become important in childhood because of their glandular involvement by tuberculosis. Calcifications of these glands very often seen in later life only indicate previous infection now healed.

Pleural Cavities. Here we may consider pleural effusions, empyema, bloody effusions into the cavity from primary malignancy of the pleura and malignant extensions from adjacent structures; transudates into pleural cavities from cardiac decompensation, localized obstructions to the venus return, polyserositis or Concato's disease, thickened pleura and localized and unilateral pneumothorax.

In the above enumerated list of pathologies there are no doubt many instances where misconceptions might arise due to brevity of statements. For instance, in pulmonary tuberculosis the fluoroscope is of value but in my opinion stereoscopic films should always be made. Then, too, a case of suspected incipient tuberculosis should never be pronounced negative to this disease because the fluoroscopic screen shows no evidence of pathology. In fact, I might generalize this last statement by saying that negative findings by the fluoroscope do not mean that the case is necessarily negative to pathology which other methods might demonstrate. On the other hand, postive findings indicate pathology, though it may necessitate other methods for differentiation.

SERVICE OF THE RADIOLOGIST TO THE GENERAL PRACTITIONER*

JOSEPH ASPRAY, M.D.
SPOKANE, WASH.

The concept of radiologic service has changed from time to time, mainly as the result of new discoveries, new and improved types of equipment, improved and superior methods of examination (technic), and as a result of the enormous mass of accumulated experience in the diagnosis and treatment of disease by radiologic methods. We feel that no apology need be made for presenting to you a brief analysis of radiologic service, though to some what we have to say will be no doubt but a repetition of that which you have previously heard many times.

It would appear that radiologic service must give adequate and enlightened aid to the physician referring the patient. It must at the same time render service to the patient in the highest degree, so that his confidence in the referring physician and in the radiologist is enhanced and perfected. At the same time we feel that what we have chosen to call "radiologic service" can only be kept up to its maximum efficiency and constantly improved in quality by close cooperation between the referring physician and the radiologic consultant. Only too often is the radiologist treated as a technician, from whom emanates a report on a film examination, and whose further interest in the case is not considered. Such an attitude on the part of the physician only operates to his own detriment. Accumulated experience in such cases will be of little real value. We, as radiologists, ask of you only that spirit of cheerful cooperation which is given to any other consultant, and which is so necessary in order that the patient receive maximum service.

Despite the many years during which we have had available the x-ray and radium for the diagnosis and treatment of diseased conditions, the average general practitioner does not fully realize just what service the radiologist can render him, and in what way he can help the patient. We shall attempt to briefly outline a few of the many conditions, in which the radiologist can and will be of distinct help in the diagnosis and treatment of disease. In a paper of this scope it will be manifestly impossible to go into detail with respect to the various findings on x-ray examination, upon which a diagnosis is made. The subdivisions must be roughly made and briefly covered.

Bones and Joints. The x-ray examination of bones and joints is perhaps better appreciated and understood than that of other systems. It is generally conceded that any severe injury to a bone or joint should lead to immediate x-ray examination. This applies also to what was formerly called a "sprain" but which frequently was a check fracture in the region of the joint surface. Fractures and dislocations are clearly shown by x-ray examinations, if properly made. The reduction of fractures and dislocations has been made more certain and easier since this reduction has been to a large extent controlled by roentgenoscopic examination during the procedure. The progress of a fracture from the standpoint of union can usually be followed by repeated x-ray examinations.

Callous formation at the site of fractures is quite early demonstrable in children but somewhat later in adults. Delay in bony callous formation and nonunion from faulty reduction are frequently found in routine x-ray examinations after fracture. It is important to recognize these conditions of malunion early.

Osteomyelitis in its chronic stages presents a well defined picture on x-ray examination, and its proper classification can be arrived at from an analysis of the type and extent of bone destruction, the presence or absence of sequestration, and the amount and type of new bone formation. In the acute osteomyelitis x-ray examination is of little value in the early stages, prior to the ninth or tenth day of the disease. This is important, inasmuch as operative interference is indicated in these cases several days before any positive findings are seen on x-ray examination. A negative x-ray examination during the first ten days of an acute infection, where suspicion centers on a bone, does not rule out an acute osteomyelitis.

In bone tumors the x-ray examination is of great importance in the correct diagnosis of the type and extent of bone involvement. In certain bone tumors, namely giant-celled tumor, sarcoma and carcinoma, where operation well above the lesion is not possible, radiation is definitely indicated.

In joint examinations one can appreciate changes in the width of the joint, clouding of the joint, roughness of the bony joint surface due to bone destruction or to bone proliferation, joint mice, and fractures involving the joint surface.

Skull. Aside from fractures of the skull, which need no further mention, we have examination of the mastoids, the nasal accessory sinuses and the teeth.

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Mastoid examination by the x-ray will give you valuable information with respect to the type of mastoid present, its extent of development, and the presence or absence of indications of infection, as cloudiness, bone absorption and cell necrosis. It also gives the relative position of the lateral sinus, important knowledge for the operating surgeon.

Sinus examination gives us the size and density of the various accessory sinuses. Not so long ago it was stated that the x-ray examination of the sphenoid and ethmoid sinuses was of little value. This cannot truthfully be maintained at this time, inasmuch as the examination of these sinuses has been markedly improved during recent years.

The importance of frequent examinations of crowned, heavily filled and devitalized teeth has been so well stressed by health authorities, physicians and dentists that this subject needs no further elaboration at this time.

Chest. The presence of air-containing tissue within the chest aids very materially in the demonstration of its structures. Minute abnormal densities are detected here, which cannot be found by other methods of examination. We shall touch briefly on tuberculosis, lung abscess, bronchiectasis, tumors, pleurisy, pleural effusion and pneumonoconiosis.

In tuberculosis of the lungs the earliest lesions are demonstrated by the x-ray examination before clinical chest findings are present. In tuberculosis one can determine by x-ray examination the extent and location of the disease process, its general type and the degree of conformance to the usual course of the disease extension, the presence of cavities, the amount of exudative and inflammatory reaction about the tuberculous lesions, the presence of pleural density and pleural effusions, secondary evidence of the latter, and distortion of the mediastinal viscera as the result of fibrosis and adhesions. In most cases the activity of the tuberculous process can be quite accurately determined from an analysis of the x-ray findings.

Lung abscess gives a dense area of inflammation within the lung, with the congestion extending toward the hilus area. After evacuation the resulting cavity is clearly shown, and its progress can be followed. Bronchiectasis gives multiple small cavities and dilated bronchi, often associated with a diffuse area of increased density, the result of stasis in the dilated bronchi, secondary infection and inflammatory change in the surrounding lung parenchyma.

Pneumonoconiosis, the result of exposure to irritating dust, mineral particles, etc., so commonly present among the miners of the Northwest, may simulate any chest pathology. It may, on x-ray examination, closely simulate the findings of chronic pulmonary tuberculosis, or pneumonia superimposed on a tuberculous condition. There are, however, certain features of a tuberculous process which are absent in the lung of the old miner, Bronchiectases and lung abscesses, with pleural thickenings, are quite common. The marked fibrosis found in these cases is probably the cause of the dyspnea so often complained of.

Lung tumors are most often secondary carcinoma, but may be primary or secondary sarcoma, myeloma or cystic tumors, pleural or echinococcal in origin. Therapy in the earlier stages of lung sarcoma may be of considerable benefit in prolonging life.

Pleural thickening and pleural effusion give characteristic changes on x-ray examination. Only rarely with a dry thickened pleura may the x-ray fail to show evidence of pleural thickening in the form of increased density, localized or general.

Esophagus. Examination of the esophagus by a thick and thin barium meal will demonstrate filling defects, due to pressure of extrinsic tumors, cardiospasm, diverticula, stenoses and dilatation.

Gastrointestinal Tract. Gastric ulcer can in the majority of cases, except where it is of the superficial mucous type, be detected by x-ray examination, giving defect in outline, frequently gastric stasis and alterations of motility and peristalsis. Often the mucosal pocket can be well demonstrated.

Gastric cancer gives characteristic filling defects, ragged in outline. The extent of the malignant growth can be fairly well determined, though the growth usually extends well beyond the demonstrable filling defect on the x-ray film. The exact location of the malignant growth will in many cases determine whether or not it is of the operable type.

Duodenal ulcer, much more common than gastric ulcer, gives both primary evidences in the duodenal outline, as filling defects, pockets, and spasm, and secondary alterations in the motility and peristalsis of the stomach.

Gallbladder disease manifests itself in the form of primary evidences, such as thickening and enlarged gallbladder shadow on film examination, and the presence of densities indicative of calculi. It also produces changes in the gastric motility, frequently increased gastric peristalsis, and deformities in outline of the duodenum and pyloric end of the stomach from pressure and adhesions. Recently the use of sodiumtetrabromophenolphthalein and sodiumtetraiodophenolphthalein intravenously, and lately the latter salt by mouth in enteric coated capsules and pills, has given us a valuable means of estimating gallbladder function and condition. A normal gallbladder is filled with this drug, which is excreted by the liver, and casts a definite shadow on film examination. A pathologic gallbladder, or one in which the duct is stopped by a calculus, fails to fill in the usual time or imperfectly fills.

Intestinal malignancy, chiefly carcinoma of the colon, gives definite and striking x-ray findings in many instances. Here, also, the location of the malignancy determines to some extent the operative procedures required in treatment.

Chronic appendicitis gives quite definite signs, except in the cases where the appendix is obliterated. Among the more important signs is the puddling or stasis of barium in the tip of the cecum and in the appendix, after the colon has been otherwise cleared by catharsis and enemas. Tenderness on palpation, limitation of mobility of appendix, cecum or lower ileum are other signs. Prolonged retention of barium in the appendix, where there is also considerable barium still in the proximal colon, is probably of little significance in itself.

Genitourinary Tract. X-ray examination of the genitourinary tract can show a large percentage of calculi. Localization of the calculi can be made, with the assistance of the ureteral catheter. Examinations after injection of the renal pelvis and ureter with an opaque medium will show outline of the pelvis and abnormalities thereof. Enlarged kidney from tumor or hydronephrosis can be often demonstrated.

Roentgen and Radium Therapy. The field of x-ray and radium therapy has only been scratched, not cultivated. A great many pathologic conditions, both superficial and deep, have been treated with varying success. We have available for x-ray therapy voltages from 40 to 300 kilovolts. Radium in the form of radium element and as radium emanation may be used.

We shall enumerate only a few of the more important conditions, in which the value of radiation therapy has been well established.

Tuberculosis Adenitis. An arresting of the tuberculous process and a fibrosis of the glands are found following x-ray treatment. The glands become smaller and more firm. Caseation may occur during treatment, but simple aspiration is usually sufficient. Chronic tuberculous sinuses are markedly improved or healed as the result of treatment.

Hyperthyroidism with or without Goiter. These cases show a fairly prompt improvement following therapy. A fall in the basal metabolic rate, improvement in the symptoms, a lessening of the cardiac rate and decreased nervousness are often seen within a short time after therapy is instituted.

Epithelioma. Here we feel that the radiation form of treatment, with thorough radiation of the regional lymph glands, is seriously to be considered. It is painless, not disfiguring, and prompt disappearance of the growth is not uncommon.

Ulcerating Carcinoma. Where there is an ulcerating carcinoma and where thorough operative removal is obviously impossible, radiation therapy is indicated. Such cases frequently show marked improvement, with considerable prolongation of life and possibly cure.

Glandular Metatasis. Radiation treatment is indicated in all cases where metatasis is present to the regional lymph glands. If operation is to be done, radiation should be given prior to operation and this should be followed by a thorough course of x-ray or radium therapy.

Sarcoma. Thorough radiation is indicated in cases of sarcoma, wherever located, if operation cannot be performed well above the local lesion.

Hodgkin's Disease. In no tumor of glandular tissue does one see more striking disappearance of the tumor nodules and improvement in the patient's condition than in Hodgkin's disease. Radiation treatment will cause the disappearance of large mediastinal masses within a few weeks. Recurrence always occurs, but these recurrent masses can be similarly treated.

Leukemia. Radiation over the spleen and over the large blood channels will cause rapid fall in the leucocytes, and the abnormal blood cells markedly decrease in number. Symptomatic improvement in the patient follows this decrease in the blood count and the diminished size of the spleen.

Fibroid Tumor of the Uterus. Fibroids of the uterus can be successfully treated by both low and high voltage therapy. In a woman near the menopause it may be advisable to treat these conditions by the intrauterine application of radium.

Fibrosis Uteri. This condition also responds favorably to radiation therapy, with marked improvement and cessation of symptoms.

Hemorrhages of the Menopause not associated with Malignancy. In these cases the intrauterine application of radium, with possibly some associated x-ray therapy, will cause a cessation of bleeding, decrease in the size of the uterus, and consequent improvement in the patient's condition.

Skin Conditions. Carbuncle, acne, dermatoses, eczema, keloid, psoriasis, rodent ulcer. In all of the above mentioned conditions the use of x-ray or radium therapy is curative, or markedly beneficial. It has been said that 9 per cent of dermatologic conditions are improved or cured by radiation treatment, or radiation treatment associated with other therapeutic measures.

If this brief resume of the field of radiation therapy and roentgenologic examination shall have brought to your mind a clearer conception of the possibilities of this field, then the inclusion of this paper in the program is justified. As a consultant the radiologist can be of great assistance to you, and render a distinct and improving service. In return you can give him facts which are of value to him by keeping him in touch with the progress of the patient and the operative findings, with a note regarding the correctness and completeness of his diagnosis. Cooperation between physician and radiologist will result in increased service to the patient, which should be our aim in practice.

330 Old National Bank Building.

UNIQUE HEART ANOMALY: FREE FIBROUS CORDS PASSING THROUGH THREE HEART CHAMBERS TO AORTA. In the case cited by J. L. Goforth, Philadelphia (*Journal A. M. A.*, May 22, 1926), pericarditis was suspected. The heart weighed 300 Gm.; it was of normal size and shape, and showed slight right-sided dilatation. The pericardium and epicardium were not remarkable. The coronary vessels were normal. The auricular and ventricular walls were of normal thickness, and the myocardium was of normal color and consistency. The endocardium and valves presented no organic lesions. The mitral valve, particularly the anterior leaflet, showed slight thickness along its line of closure, but was everywhere smooth and shining. The aortic cusps were not remarkable, except as described. Arising from the right auricular wall 1.5 cm. from the annulus ovalis, a tiny, grayish-white, rounded, threadlike, smooth, glistening cord, 0.5 mm. in diameter, ran freely and unattached toward the slightly patent foramen, and, near the lower rim of the annulus ovalis, apparently obliquely pierced the interauricular wall. Attached to the annulus ovalis, near its inferior margin in the left auricular wall, it traversed the left auricle and, following the course of the blood flow, passed down through the mitral orifice well into the left ventricle. Here it turned, and, forming a parabola-like curve around the anterior mitral leaflet, but sufficiently below it so as not to interfere greatly with its function, apparently, proceeded toward the aortic valve. As it approached the anterior cusp, it perpendicularly pierced it and attached itself to the wall of the aorta, 8 mm. beyond, thus virtually transfixing this cusp. The cord tended to increase in size as it progressed: in its course through the left auricle and ventricle, it increased from 0.6 mm. to 2 mm. in diameter; it was thickest in its curve around the mitral leaflet, reaching a diameter of 2.5 mm. in this section.

STUDIES IN SEPTICEMIA*

REPORT OF FIFTY-EIGHT CASES

HAROLD C. BEAN, M.D., F.A.C.P.
PORTLAND, ORE.

Progress in medicine is made possible by the recording of observations made in the laboratories of research or in clinical medicine where detailed studies of cases are made. Medical research and original contributions to medicine do not need to be discussed at this time, neither does the value of case reports, either single or in a group of cases. Sir William Osler, during his first year after graduation, began energetically to record and report cases of interest, and he continued throughout his lifetime in following this plan. This paper includes a more or less detailed study of a series of cases belonging to the same general class, and are presented to you for consideration, not in any way as an original arbeit, but rather as an interesting group of all too common clinical syndromes.

Fifty-eight cases of blood stream infections with the organism belonging to the coccus group make up the series. These cases have been observed from May, 1920, up to and including the present time. I wish at this time to express my gratitude to Dr. Selling, my former associate, and many other members of the profession who have kindly allowed me to observe and record many of these observations. The majority of the cases were followed throughout their course, whereas the remaining ones were seen in consultation on one or more occasions, their histories and charts studied and notes made from them. From the early work of Schottmeuller and subsequent observations by Jochman, Ollie, Osler, Poynton, Payne,, Libman and others our knowledge of so-called septicemias has steadily increased until at the present time a definite clinical entity is established.

We have included in this report only those cases that have been proven to belong to the streptococcus and staphylococcus groups. Six cases of meningococcus septicemia were observed and studied, but are not included for the reason that they are usually masked by the clinical picture of cerebrospinal meningitis, which does not come under the discussion of this type.

GENERAL PATHOLOGY

The coccal organism as it enters the blood stream, from whatever point it may, travels apparently throughout the body and many lodge temporarily

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* Read before City and County Medical Society, Portland, Ore., April 7, 1926.

ORGANISM	TOTAL CASES	BLOOD CULTURE		MALE	FEMALE	AGE (AVERAGE)	PORTALS OF ENTRY					THERAPY						RECOVERY OR IMPROVED	DEATHS	MORTALITY %
		36 Hrs.	72 Hrs.				EAR	NOSE	THROAT	PUERPERIUM	MISC.	TRANSFUSIONS	MERCUROCHROME	GENTIAN VIOLET	SODIUM CACODYLATE	SERUM	SYMPTOMATIC SALICYLATES			
STREPTOCOCCUS HEMOLYTICUS	40	32	8	14	26	19	16	4	8	10	2	26	13	0	8	3	12	10	30	75%
STREPTOCOCCUS NON-HEMOLYTICUS	14	10	4	8	6	18	2	1	3	0	8	1	0	0	1	0	8	1	13	92.8%
STAPHLOCOCCUS	4	3	1	2	2	14	3	0	0	0	1	1	0	3	0	0	0	0	4	100%

in various areas, such as the spleen, liver, kidneys, or the various extranasal passages, lymphatic glands, the mucous membrane of the heart and end-arteries and the bone marrow, where the organisms rapidly multiply, causing localized suppuration, or are incapacitated by the fibrous proliferation and remain dormant until subsequent time, when they may rapidly enter the blood stream and cause a remission. Such an event commonly occurs in subacute endocarditis. The universal dissemination of organisms in the body explains the insidious onset of symptoms and the well-known uncertainty of prognosis in similar cases.

The above fact also explains the apparent futility of modern therapy in septicemia and justifies partially the trend, at frequent intervals, of the profession to grasp any new immunologic or chemical therapeutic agents.

SPECIAL BACTERIOLOGY

It is unnecessary at the present time to discuss the bacteriology of this group, only merely to state that the well-known hemolitic and nonhemolitic streptococcus and the staphylococcus are the organisms generally found in this class of diseases. The pneumococcus, when after careful observation is made, can be found in the blood stream of an extremely large percentage of all pneumonias and the rare cases of pneumococcal meningitis. The gonococcus, which has been so thoroughly studied by Thayer, both in its relation to the picture of septicemia and also the damaging effect on the endocardium, is not included. There is one point of great importance in the bacterial study of the streptococcus group which I think is often overlooked; that is, the latent growth of the *veridans* or nonhemolitic type which may only make its appearance on the blood agar plates forty-eight to seventy-two hours after the culture is taken. This fact is the prevalent cause of a negative blood culture report, for in many laboratories reports on cultures are often demanded in forty-eight hours. The hemolitic type usually reveals its characteristic zone of hemolysis within thirty-six hours.

PORTALS OF ENTRANCE

As revealed by the charts, the most common source of entrance in the cases under discussion is the aural region, usually preceded by an otitis media, during which one or more paracenteses have been performed, or through the nasal passages and the ethmoidal cells as revealed by the two cases of septicemia with complications, which occurred following prolonged exposure in swimming tanks, streptococcus sore throat, epidemic and puerperal sepsis. Three of the cases followed what was apparently rather small benign abrasion of the skin around the base of the nails of the fingers.

It is interesting to note at this time that, although the almost universal use of intravenous medication is followed at the present time, there are no cases of septicemia in this series traceable to that origin. Perusal of literature reveals cases of septicemia following various other injuries, such as basal fractures of the skull, postoperative infections, instrumentation, such as a passage of the cystoscope and bronchoscope, but again the well-known fact that the body has acquired immunity against the entrance and multiplication of organisms within the blood stream is illustrated.

Sex. There were twenty-seven males and thirty-one females in this series.

Age. The youngest case was an infant of twenty-eight months and the oldest was a female of sixty-six years.

CLINICAL SYMPTOMS

This group may be divided into early and late.

A. *Early.* It is generally conceded that septicemia may be in progress for several days before any phenomena can be detected. Many cases of unexplained septic temperature must be considered a potential septicemia until proven to be otherwise. Rigor may occur early in the disease, as recorded in thirty-two of this series, whereas it may occur late, if at all, and the importance of this has been brought out various times during the past ten years in the literature. It was originally supposed that one could not have septicemia without chills and consequent sweats, but recent advances in bacteriology have clearly demonstrated the fact that one should not wait until the appearance of chills before the diagnosis is made. It is generally conceded that the chills occur at the time that a new group of organisms are given off into the blood stream by the foci, when the rapid multiplication of the organism occurs. Hence the prevalent idea that the most suitable time to take a blood culture is at the beginning of a chill, but this is not necessarily so.

Nausea and Vomiting. An early symptom and often mistaken for a primary gastric disease, whereas it is of toxic origin.

Joint Involement. This may be manifested by mere stiffness and temporary tenderness and pain in the structure adjacent to the various joints of the body, or may be manifested by frank suppuration of the joint itself as is so commonly found in the staphylococcus cases.

Embolic Processes. a. The classical example of this is the petechiæ which are most commonly observed in the conjunctivæ, the outer surfaces of the upper arms and under the matrix of the nails, along the costal margins of the upper abdomen and elsewhere.

b. The tender nodes which Osler early described are due to embolic processes in the larger arterioles, especially seen in the lateral surfaces of the distal joints. These may appear rapidly and disappear in the same manner, evidenced by pain, discoloration and occasionally suppuration. The same process may occur along periosteal surfaces of the ribs and are often mistaken for intercostal neuralgia or even pain of cardiac origin.

c. Embolic processes of spleen. Splenic infarcts are too well known to more than mention at this time but recognized splenitis is an extremely common observation and was noted in sixteen of these cases. The course of these infarcts may lead to suppuration and one case necessitated drainage of large necrotic area in the spleen.

d. Renal infarcts. These may be so small that observation is not made but as a rule, if the urine is carefully observed, hematuria or hemorrhagic nephritis may be noted during the course of septicemia. In many cases repair is rapidly made and the kidney returns to its normal function, or as Addis has so clearly pointed out, may be the cause of a subsequent chronic renal infection.

e. Anemia. Rapidly progressing anemia is one of the early symptoms of this disease and again it is well known that septicemia must be considered as one of the common causes of unexplained destruction of blood cells. Brill, in a recent extensive study, has described a condition of acute anemia which he considers is due to a rapid hemolizing agent in the blood stream.

B. *Late Symptoms.* Marked emaciation, progressive anemia and development of endocarditis, development of increased areas of petechiæ and purpuric spots, at the same time often wine colored urine of marked ahematuria. This condition rapidly progresses into a state of toxemia with consequent coma and death. In cases of staphylococcal septicemia multiple furuncles which may necessitate drainage, but this is of course only temporary.

TREATMENT

The value, if any, of this report is in the different procedures of treatment followed in the series. Transfusions of citrated and whole blood were in great vogue early in this period and many of the cases received large quantities of blood. The total number of cases was twenty-eight. The results were not startling except in those cases of hemolyticus streptocemia which followed during the puerperium. These cases, as is well known, develop an extraordinary immunity to the streptococcus and often without any special therapy. Of the ten cases which were in this subgroup and recovered, blood was given to eight. Of the remaining transfusion cases, twenty in all, three only recovered. One of these was a streptococcus veridans which recovered after two transfusions of a small amount of whole blood.

Mercurochrome. Since the work of Hill, Pemberton, Young and others, mercurochrome and other anilin dye preparations have been used quite extensively with varied results. Young and his coworkers were and have been very optimistic but others have failed to confirm his observations. Recently Brill and Meyers of the University of Oregon reported in detail a study of five cases with conclusions which were adverse to the use of mercurochrome. We have given the dye in 1 per cent solution to twelve cases of hemolyticus streptococcus and two cases of the nonhemolyticus with one recovery and one case under observation at the present time, who is apparently improving after three intravenous injections. We have seen two cases of hemorrhagic nephritis occurring after the administration of the drug, and a personal communication with a colleague revealed a sudden nephritic death within two days after the mercurial solution. A gentian violet solution was given in three of the four cases of staphylococcal septicemia without any apparent inhibition of the organism.

Streptococcus Serum. This mode of treatment was tried in four cases, three of which were given the antistreptococcus; the other one was given serum inactivated after removal of blood from another patient with a similar disease. These cases included four hemolitic and one nohemolitic with a consequent 100 per cent mortality.

Salicylates. The tendency often in medicine is to revert to some of the early forms of therapy and this is one of the cases of such a procedure. Due to the universal practice of administering salicylates to cases of acute rheumatic fever, they have been urged in septicemia. Ten cases of this series were given salicylates both orally and intravenously to the point of salicylism with apparently somewhat favorable results. Out of the eleven cases who recovered in the total series, seven of them received this form of treatment.

Sodium Cacodylate. This was tried in fourteen cases, four of which recovered but two of this number had rather extensive transfusions of blood.

DIFFERENTIAL DIAGNOSIS OF SEPTICEMIA

Not more than a decade past all cases of prolonged unexplained fever were treated as possible and many times probably tuberculous. Thus many persons were urged to take up the sanatoria treatment, only later discovering that the cause was a septicemia, revealed by a subacute endocarditis. Every case of prolonged fever is not necessarily tuberculosis and the old axiom of the clinicians that a hyperpyrexia persisting over three weeks means tuberculosis must be revised, since our bacteriologic studies have become more accurate. Petechiæ, painful nodes, enlarged spleen, chilly sensations and progressive anemia with slight rise in temperature and endocarditis often insure the diagnosis. Pernicious anemia, typhoid, malaria are often diagnosed when the underlying cause is septicemia. Reports of repeated blood cultures will often reveal the true condition which may be missed, if dependence is placed on one negative culture.

PROGNOSIS

Behrens, in a recent number of *Annals of Clinical Medicine,* describing subacute endocarditis and reporting seventeen cases, summarized his paper by the following statements: "As for treatment we have tried all the arsenicals, including the cacodylates, the neoarsphenamins. We have given quinine hydrochloride, salicylates, mercurials, both in large doses intravenously and smaller doses suggested by others. We have given the ordinary vaccine both autogenous and stock. Blood injections have been given many times. All types of drugs and foods were selected. Up to the present time our results show death in 100 per cent of the cases." Billings, on 100 cases he has seen, says that 97 per cent died. Libman thinks four out of one hundred and fifty of his cases recovered. In conclusion, Behrens states, in cases where valvular lesions are accompanied by the symptomology given and a *viridans* culture is obtained, the prognosis is extremely grave. Mortality is almost 100 per cent.

Barker states that as a rule staphylococcal septicemia is fatal and, although gentian violet and other similar dyes have been recommended, the prognosis is extremely poor. The treatment should be symptomatic, hoping that the body will develop sufficient immunity to overcome the organisms in the blood stream.

E. Libman, *American Heart Journal,* Vol. I, No. 1. Conclusions:

Prognosis. 1. Small number of spontaneous complete recoveries in the type of case with which we first became acquainted.

2. There is a slightly large number of cases that come under observation with a sequela of a former attack of the disease, either just before or directly after the infectious stage, that have terminated or without any clinical recognition of the attack.

3. There occur mild cases of short or long duration.

4. The disease may exist in recurrent form.

5. In the course of healing, the lesions of subacute bacterial endocarditis present a round of developments of chronic valvular diseases.

CONCLUSIONS

1. Septicemia due to coccal origin is much more frequent than is generally supposed. Careful observations will bear this out.

2. Streptococcal septicemia can be divided into three general classes: the hemolitic, the nonhemolitic and the puerperal cases. The hemolitic are characterized by the hemolizing effect in the blood stream, the development of numerous petechiæ with the usual high mortality. The nonhemolitic or viridans cases are characterized by definite remission and associated with subacute endocarditis and periods of a bacteremia blood examination. The puerperal cases are characterized by the unusual susceptibility to treatment.

Treatment. Specific treatment, with the exception of the possible use of large doses of salicylates, is valueless. Transfusions of whole blood have apparently been a decided factor in several cases. The value of this procedure is still doubtful. In many cases mercurochrome has been found wanting. As Schottmeuller, Yochman, Wassermann and Flexner, after years of study, perfected the meningococcus serum, may the future bring forth that much desired agent, either chemical or bacteriologic, or possibly a combination of both, that can be used intravenously as a bactericide for the streptococcus and staphylococcus. Until that time we must be content with symptomatic treatment.

APPENDICITIS IN INFANT

PAUL W. SWEET, M.D.
CENTRALIA, WASH.

This case is reported because it is desired that this comparatively infrequent condition, appendicitis in infancy, be placed on record.

This infant, sixteen months of age, female, was brought to St. Luke's Hospital by Dr. Joel E. Toothaker, who deserves credit for the early recognition of the condition. The parents of the child brought her to the doctor because of a cold which they said she had "on her lungs," Dr. Toothaker's careful examination revealed what he thought was appendicitis.

The white cell count was 16,000 with 90 per cent polymorphonuclears. X-ray of the chest was negative. I was called in to see the case and concurred with the doctor in his diagnosis and advised immediate operation.

A very small right rectus incision was made and a somewhat circumscribed colon bacillus abscess was opened and drained. The appendix was not of easy access, so it was not removed. The small bowels were greatly distended and the abdomen was closed with difficulty around a soft rubber tissue drain.

In the postoperative treatment fluids were given per rectum every hour. Ten minimus of paragoric were given per rectum every four to six hours and nothing by mouth for three days. The small abdominal wound broke down after the fifth day but otherwise the child made an uneventful recovery.

THE EFFECT OF IMPAIRED VISION ON LINCOLN'S PERSONAL HABITS*

ED. E. MAXEY, M.D.
ABERDEEN, WASH.

The following story appears in Lamon's Life of Lincoln and in other historical works, and more recently, February 6, 1926, was quoted in an article by F. L. Black in the Dearborn Independent, as one of Lincoln's premonitions of death.

"Just after his election in 1860, according to a story he (Lincoln) told his secretary, John Hay, he was 'tired out' with the excitement created by receiving the election returns and went home to rest, throwing himself upon a lounge in his room.

" 'Opposite to where I lay,' said the President. 'was a bureau with a swinging glass upon it. In looking in that glass, I saw myself reflected nearly at full length but my face, I noticed, had two separate and distinct images, the tip of the nose of one being about three inches from the tip of the other. I was a little bothered, perhaps startled, and got up and looked in the glass, but the illusion vanished. On lying down again, I saw it a second time, plainer if possible than before; and then I noticed that one of the faces was a little paler, say five shades than the other. I got up and the thing melted away. I went off, and in the excitement of the hour forgot all about it, nearly but not quite, for the thing would once in a while come up, and give me a little pang, as though something uncomfortable had happened.

" 'When I went home, I told my wife about it. A few days after I tried the experiment again, when sure enough the thing came back again; but I never succeeded in bringing the ghost back after that, though I once tried very industriously to show it to my wife, who was worried about it somewhat. She thought it was a 'sign' that I was to be elected to a second term of office, and that the paleness of one of the faces was an omen that I should not ~~se elife~~ through the last term.' "

An experience like this, happening to a present day man of average intelligence, would send him promptly to his physician, for he would at once recognize the double vision as "a sign," not of impending death, but of some serious impairment of his eyes. When I first read this story some eight or ten years ago, I remember I was impressed with the scientific import of the double vision complained of; in fact, I even prepared and delivered a short talk for a Y.M.C.A. meeting on the subject of my paper tonight.

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* Read before Puget Sound Academy of Ophthalmology and Oto-Laryngology, Tacoma, Wash., April 20, 1926.

Shortly after this I was surprised to read in one of my scientific journals a short article calling attention to this same eye trouble of Lincoln's, treating the subject in a scientific light, and even including one or more front view photographs of the martyred president. Unfortunately, however, I cannot recall the author's name, nor can I locate the journal in which it appeared. In any event the recent article in the Dearborn Independent would indicate that the subject had not attracted the attention of the public press, and, in view of this lack of public and scientific knowledge, I feel justified in bringing this matter to your attention tonight.

As the above story appears in other histories of Lincoln's life, I think we must accept it as being authentic. In other words, that he actually did see a double image of his face, but unfortunately the historians do not tell us the relative location of the paler image, whether it was above, below or to one side. It seems evident, however, that Lincoln was a sufferer from some type of heterophoria (eye muscle imbalance). Very probably it was hyperphoria or cyclophoria (hyperphoria being the condition where the visual axis of one eye is higher than that of the other eye, due to defect of the elevating or depressing muscles of the eyeball, while in cyclophoria the rotation of the eyeball is impaired, due to impaired function of the oblique muscles). This view of Lincoln's eye defect was also held by the doctor referred to above and his photographs seemed to verify such view.

In further verification of such view we will discuss some of Lincoln's personal habits and try to give a scientific reason why he did certain things. Going back to his boyhood days, we are all familiar with the habit he had of doing much of his reading and studying while lying prone on the floor or leaning across the country store counter. In my opinion this position was assumed, not because he got better light from the fireplace, nor because he did not have a comfortable chair to sit in, but because the prone position was a more comfortable one for prolonged use of his eyes. In hyperphoria, as explained above, one eye looks higher than the fellow eye, the upward rotating muscle of the affected eye being shortened or the opposing muscle weakened, rendering it difficult or tiring to pull the affected eye down below the horizontal line of vision and maintain that position for any length of time; hence the more comfortable reading position would be with the page somewhat higher than the level of the eyes. Tilting the head downward, with chin in, gives this position for the eyes, but this position involves the prolonged contracture of several muscles and cannot be maintained long. However, the prone position does give a comfortable reading position for such patients, because the page is higher than the horizontal level of the eyes, and observation shows that nearly all hyperphoric patients assume this position intuitively.

My son has a manifest hyperphoria of some six degrees, and ever since he has been able to read, his favorite position for reading is prone on the floor or bed. If he sits in a chair to read, he will invariably slide down so that he sits on the lower portion of his back and, with feet in the chair and knees high, he has assumed the "tilting downward of the head" position mentioned above, and he is "looking up" when reading. I have noticed this same habit of position in other hyperphoric patients.

All of the historians, I think, mention Lincoln's frequent complaint of "feeling tired" or of being "tired out," and none of them fails to mention the ever present "lounge." He seems to have had a lounge in every room he frequented, and, further, it is a matter of frequent observation in his biographies that he used these lounges on every opportunity; in fact, he used them so often that critics of Lincoln have called him lazy. It is my conviction that most of his "tired out" feelings were due directly or indirectly to eyestrain. It is a matter of history that he could dictate letters or talk with friends for hours without tiring, while lying on a lounge. In fact, he has been said to have frequently excused himself and lain on the lounge during the discussion of important matters of business or state, even during the meetings of his cabinet.

Here, again, the position of his eyes in relation to the objects looked at was really the determining factor in prompting him to resort to the lounge so habitually, for, on lying on the lounge, with head and shoulders somewhat elevated, his line of vision, in looking at most of those standing or sitting in the room, would be a little higher than the level of his eyes; and if perchance he found unconsciously that his eyes were strained, it is evidently much easier and far less conspicuous to close the eyes and keep them closed for a time when lying down than it is in the sitting or standing position. Hence the comfort of the lounge and its frequent use by him.

Another cause for that weariness so frequently complained of by Lincoln is found in his height. He was, as you know, a very tall man, taller than most men he had to meet. Therefore, when standing at a reception or any other public function where he had to talk to people, he was compelled to look down, an uncomfortable position for his eyes, especially when added to the strain of standing for some time.

After his election to the presidency, Lincoln seems to have derived very little personal pleasure from the theatre. True, he went on various occasions "to please the people," as he expressed it, but he dreaded these nights at the theatre because he always came away "tired out." Here, again, his eye condition gives us the explanation. The President's box was considerably higher than the stage and main body of the house. In other words, he was up where the people could see him, which compelled *him* to look down most of the time through one, two or three hours—again that tiring position for his eyes. Incidentally, this may explain why so many of us like to sit among the bald heads in the front rows.

I have found no record to show that Lincoln or any of his family or friends or even his medical advisors had any suspicion that he had a congenital defect of the eyes. So far as I can learn, glasses were not worn by him, except for near vision. Therefore, we do not know the refractive condition of his eyes. It is strange that a man of his mental capacity would place or be accused of placing a superstitious interpretation on the double image seen in his mirror, and it would be of extreme scientific interest to know what effect, if any, the proper correction of Lincoln's eye defect would have had on the mental and physical habits and the personal characteristics of this much loved and honored man.

INTRAOCULAR HEMORRHAGE

Clarence W. Shannon, M.D.
SEATTLE, WASH.

Hemorrhage from the uveal tract or retina may occur as the result of (a) rupture of vessel wall, or (b) diapedesis.

Causes of rupture are:

1. Increased intravascular pressure, local or general. (a) Local: Contusion of eye, venus thrombosis, optic neuritis and all forms of retinitis. (b) General: Hypertrophy of left ventricle, straining, coughing, cessation of menstruation, high arterial tension.

2. Diminished support from sudden lowering of intraocular tension. This is subchoroidal hemorrhage after iridectomy for glaucoma.

3. Degeneration in vessel walls.

Causes of diapedesis are:

1. Increased intravascular pressure.
2. Alterations in constituency of blood.

The damage done by any extravasation of blood depends:

1. On nature and density of tissue affected. Delicate tissue as retina, if torn by hemorrhage, is destroyed.

2. On amount of subsequent organization that takes place in clot, leading to fibrocicatricial tissue which by its contraction may press or pull on surrounding structures. The extent of the contraction depends on the rapidity with which blood coagulates, the hemolytic properities of the serum and the absorbing power of the lymphatics in the tissue in which the hemorrhage takes place.

Hemorrhage from the iris may be extravasated into anterior chamber (hyphenia). It is usually the result of injury, but may occur from engorgement with blood, as in acute iritis, also if vascular degeneration is present, such as follows long standing cyclitis or glaucoma. If angle of anterior chamber is not blocked, it is readily absorbed. If retained a long time, it may organize into a large pinkish grey colored mass at bottom of anterior chamber. These masses microscopically consist of endothelial cells, enclosing spaces filled with cholesterin crystals and other debris of degenerated blood clot.

From blood retained in the anterior chamber the hemoglobin may pass into the substantia propria of the cornea, by diffusion producing blood staining of cornea. After occurring in eyes with increased tension, it may give brown or green appearance of cornea, depending on time existing. This condition at first sight may be mistaken for dislocated lens in the anterior chamber, because of a narrow band at periphery of cornea. The rest of the circumference remains clear. Histologically granules are found between the fibres of the substantia propria. These are of the nature of hematoidin (containing no iron). The pigment is slowly absorbed from periphery towards center of cornea, often taking from eighteen months to two years to clear completely.

Hemorrhage into the vitreous may arise from the ciliary body or retinal veins. Apart from injury the condition may occur spontaneously. In young people, more often men, recurrent attacks take place, sometimes alternating with nose bleeding. In these cases the blood coagulability has been found to be raised and it is probable that hemorrhage is due to thrombosis occurring in a small vessel which subsequently gives away, owing to the vis a tergo.

The blood may be derived from either the ciliary body or retinal veins. If from retinal veins, rupture of hyaloid membrane must occur. In older patients vitreous hemorrhage is usually associated with diseases of veins of the wall. The extent of hemorrhage varies with the size of the vessel which gives way. Sometimes the whole vitreous is filled with blood which can be seen behind the lens. In other cases it is merely a haze in the vitreous. Between the two conditions varying accounts have been reported.

The subsequent change produced by hemorrhage varies with the constituents of the blood extravasated and the absorbing power of the intraocular lymphatic system. The blood being in contact with living tissue takes a long time to coagulate. If the blood coagulability of the patient is high, due to blood containing an excess of calcium salts, it will coagulate more readily and rapidly than normal, and then will not undergo absorption so rapidly. The corpuscles discharge their hemoglobin which is absorbed by the lymphatics. The stroma is broken up and, due to degenerative processes, cholesterin crystals are frequently found. The fibrin in the vitreous, which sometimes can be seen on the posterior surfaces of the lens, becomes absorbed or organized. The endothelial cells from the blood vessels of the retina or ciliary body spreads into bands of fibrous tissue, developing a condition known as retinitis proliferous. These bands of fibrous tissue by their contraction may cause shrinking of the vitreous, on detachment of the hyloid, and if later adherent to the retina, detachment of that structure also. Hemorrhage may occur from a ciliary or choroidal vessel during excision of the eye, in which case the recent character of the blood clot is sufficient to distinguish it.

Hemorrhage from the choroid occurs frequently from the giving away of a vessel due either to injury, to sudden lowering of intraocular tension or to thrombosis of a choroidal vein. In the two latter cases disease in the vessel wall plays an important predisposing part. The sudden reduction of intraocular tension, as after iridectomy for glaucoma, may cause a rupture in a choroidal vessel. If this be a large artery in the outer layer of the choroid, the blood is extravasated between the choroid and the sclerotic, pushing the former inward. As a result the lens may be pushed forward and, if the bleeding continues, the lens, retina and choroid escape through the wound. If a small vessel in the choriocapillaris of the choroid gives away, the blood may rupture through Bruch's membrane and hemorrhage take place into the subretinal space. Smaller entravasations of blood, such as occur in the macula in myopia, may remain localized in the choroid. Such hemorrhages are followed by intense secondary pigmentation, the pigments being partly derived from the blood and partly from the proliferation of the retina and choroidal pigment cells.

Hemorrhage in the retina. The amount of blood extravasated into the retina and the damage done it thereby depends on the size and the situation of the vessel which gives way. If it be superficial and bleeding takes place beneath the hyloid of the vitreous, it is usually extensive. The blood shrinking downward separates the hyloid from the retina and usually takes the form of a boat-shaped red ace which is darker in color towards the bottom, owing to the greater mass of blood being present in that situation. This form of hemorrhage does not give rise to much destruction of retinal elements, hence good vision may be restored. Occasionally the hemorrhage may be so extensive as to cause rupture of the hyloid and give rise to retinitis proliferous.

Hemorrhage in the nerve fibre layer usually has a flame-shaped appearance and it is often striated, owing to the anatomic arrangement of the nerve fibres. Hemorrhage into the deeper layers of the retina causes large destruction of tissue, the retina being torn up with the result that permanent scotoma remains in the field of vision.

Retinal hemorrhage will persist for months without showing appreciable changes. The subsequent changes depend largely upon the absorbing power of the perivascular lymphatics. As the blood in the retina disintegrates, it gradually becomes darker in color and finally black, so that clinically it cannot be distinguished from the retinal pigment. Microscopically it can be distinguished from the fact that the pigment derived from hemoglobin contains iron and for some considerable time after its occurrence it will yield the test for this substance. The breaking up of the stroma of the corpuscles may give rise to crystals of cholesterin which will appear as glistening points in the fundus.

727 Stimson Bldg.

THE ROLE OF THE SKIN IN GENERAL MEDICINE*

Lyle B. Kingery, M.D.
PORTLAND, ORE.

Hebra many years ago referred to the skin as the mirror of the system. While such a figure may sound dramatic, it rather aptly suggests how frequently reflections on it disclose fundamental truths relative to the pathology of disease in general.

Perhaps in part because of the relative youth of this branch of internal medicine as a specialty, perhaps because of a former tendency on the part of medical schools to lightly consider this portion of their obligation to students, it would seem there has been a rather general inclination either to refuse to recognize its importance or to ignore the possibilities its proper investigation might disclose in various lines of medical endeavor. This situation is is not entirely surprising. Even in the beginning, including the time of Hebra, dermatology was for the most part a study of morphology, and the skin was considered to a large extent as an organ wholly dissociated from the tissues which it enveloped.

The early German workers attempted to catalogue all dermatoses according to the cutaneous manifestations alone. The first studies of the French were along lines of the opposite extreme. Only recently has there been an endeavor to coordinate cause and effect, and it is upon the results of those efforts that our present conceptions of dermatology are based.

It is probable that the history of the development of any branch of internal medicine would resemble that of dermatology. The clinical study of this subject is actually the macroscopic study of the skin. Its microscopic study bears the same relation to dermatoses that the microscopic study of any lesion anywhere in the body bears to its gross appearance. To a certain extent the etiology of disease may be illuminated by an understanding of its microscopic composition. To a larger extent, however, the etiology may be explained through the medium of bacteriology, biochemistry and serology in its broadest sense. Nothing may be rightly neglected in the scope of physical diagnosis, laboratory diagnosis or a knowledge of the course and character of the illness which furthers this end.

The skin is obviously an organ of the body as much as the liver or kidneys, subject to the same laws of health and disease as those governing the other organs, the only difference being its exposed and external position. It receives its nourishment from the blood stream, and is, therefore, affected by the quantity and quality of the constituents of this fluid. It is affected as any other organ by nerves and vessels. By virtue of this intimate internal relation it would seem permissible to suggest that an intelligent appreciation of changes occurring on the skin may quite occasionally prove of assistance in the early recognition and proper understanding of various systemic processes.

It is obviously impossible in a discussion of this kind to more than point out certain groups of diseases, in which the skin may be of diagnostic importance. In so doing, papers by Leloir and Engman and the various texts have been freely quoted.

Perhaps as interesting as any are those cutaneous changes which reflect the general physical makeup of a patient, and permit us even in infancy to definitely predict the pathologic experiences, through which that individual will surely pass. We recognize as an example of this the exudative diathesis type. Forerunners of this tendency shine out early in life, often marking the patient a clinical entity, whose first experience is the all too frequent picture of eczema. Some of these, to be sure, may be influenced or caused by a diet badly balanced with respect to fatty or carbohydrate intake. Yet in many cases these are only contributory to the picture which reveals more fundamentally the characteristics of the patient as a whole. The process usually occurs on the face or body and not infrequently is followed through life by adenoids, asthma, bronchitis, enlarged glands, and tells in unmistakable language the phases of pathology which that patient is likely doomed to experience. This type of individual never changes. Sensitization may be an important factor; improper feeding may play a part. Heaping up of cells about the follicular openings, especially on the extremities, may point early to hypothyroidism as an adjunct. Still the cutaneous changes are obvious and form a part of the diagnostic picture.

Again, and equally striking, in infancy and early adolescence is the picture of presenility, graphically depicted on the skin by the condition known as "xeroderma pigmentosum." The effect of the actinic rays is usually given as the explanation; still the skin of these persons is a senile skin. The histology of a senile skin at the age of eight or ten years reveals no differences from that of an old man or one continually exposed to roentgen or radium rays. This interesting condition first shows itself by exaggerated freckles, soon followed by pigmentation, telangiectases, bizarre keratoses, and finally the formation of carcinoma with early metastatic tendencies. The skin, therefore, is a senile skin, and the person it covers is fundamentally old. The signs and symptoms on the skin of these patients give one at once a clue to the equation of the individual.

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* From the Department of Dermatology and Syphilology, University of Oregon Medical School.

Age, although computed by time and years, may be indicated equally on the skin. A man is not only as old as his arteries, but also as his skin. The skin shows the early signs of senility, whether thirty or eighty years have passed since birth. These indelible signs of life-wear are seen first on exposed surfaces, and on the chest in the form of atypical cornifications of the epidermis called "keratoses," of persistent freckles which do not disappear during the winter, discolored areas of the skin and finally the wrinkled, atrophic appearance seen in old age. The skin on the back of the hand is often a true gauge as to the wear and tear of the body in relation to years.

Significant cutaneous changes are not confined to the extremes of life, for practically without exception increased oiliness of the skin of the face, and the unsightly comedones are the earliest signs of approaching puberty. The marked sebaceous hyperactivity of this age is as truly a secondary sex characteristic as the appearance of hair on the pubes or the face. They are significant of a fundamental systemic change, through which the entire organism is passing.

Another group of conditions in which reflections may be observed on the skin is that related to the endocrine system. To be sure, large gaps are still conspicuous in our knowledge of the individual and related activities of these organs, and their relation to the fundamental processes of the body. Here and there isolated facts regarding their probable normal and abnormal functions have been given us, and among these facts are to be enumerated microscopic and gross changes on the skin.

I need but to mention certain abnormalities of depigmentation or hyperpigmentation, of increased sweat secretion or its opposite, of the development of the secondary sex characteristics mentioned above, to remind you of this. Perhaps as striking as any are certain of the cutaneous changes observable in hypothyroidism. Sometimes the earliest changes are on the skin. Their detailed description is unnecessary because it is common knowledge. They include the peculiar and characteristic dryness and scurfiness of the skin; the shrivelled presenile appearance of the skin as a whole, different from other types of presenility in that the changes are more marked on the covered portions; myxedematous pads of a peculiar resiliency in the supraclavicular spaces; a thinning of the hair, the hair having a dry, lack-lustre appearance, etc. Properly observed and interpreted, these changes may be as diagnostically valuable as the reduction tests, metabolic readings, the pulse, or any other single point of evidence upon which our advice as to the future activity and care of the patient is based.

Still another group of pathologic processes may have occurred to you because no special or general field of medicine is entirely free from the responsibility of their proper interpretation as a complicating factor in many of the clinical problems one is called upon to unravel. Varying from the evanescent picture of urticaria and angioneurotic edema, including erythemas, multiforme, nodose, and scarlatiniform in type, and not infrequently severe purpura, and cutaneous gangrene, the so-called toxic erythema group offers problems of clinical investigation of no mean importance. Osler realized this and renewed an appreciation of the importance of this group which before had waned. The multiplicity of clinical pictures may make for confusion as to the practical significance of each, yet I am sure it has occurred to you that they must be responses to blood-borne, injurious agents, and they vary, therefore, according to the intensity of the offender, and the time during which it acts. A chemical may produce a wheal, or a papule, a tuberculous lesion, a spreading plaque, a hemorrhage, gangrene or a node, through local vascular effect or an interference physically or chemically, in the nutrition of the part. Similar results may be produced by embolic foci of microorganisms brought to the skin. The offending chemical may come from numerous sources, a food stuff rendered innocuous through sensitization, foreign serums parenterally introduced, focal sites of infection, drug sensitization, acute invasion of microorganisms, as in the infectious diseases, etc. The study of an individual case presenting an eruption belonging to the erythema group, it would seem, might be a task.

A simple urticaria relieved by saline purgation and proper dietary regime is therapeutically simple; the recurrent erythema multiforme may, on the other hand, tax every department of clinical investigation. Cultural studies may disclose a microorganism in the general circulation, when an aortic murmur may be well established or just beginning. Sensitization tests may demonstrate a condition of allergy; roentgen ray, an old appendicial trouble; the dentist, an involved root, etc.

It would seem well to remember in our consideration of this group that many organisms beside the spirochete of syphilis may remain latent in the system. Everyone is familiar with the picture of recurrent symptoms coincident with repeated liberation of streptococcus viridans in the blood stream. Not infrequently in its invasive stage this organism causes some form of erythema multiforme. A patient enters the hospital with erythema multiforme, purpura or some other cutaneous manifestation of this group. He may or may not have intestinal crises or rise of temperature. A short sojourn effects a symptomatic cure, yet that individual deserves watching unless the etiologic factors in the case have been convincingly demonstrated. Negative blood cultures are not convincing. A mitral harshness may be mistaken for an anemic murmur, when it may well be the incipient stage of a building colony on the valves. An erythema multiforme at ten or twelve may explain the patient's death years after. Syphilis is not the only eruptive disorder which delays its sting for years.

As being due to a somewhat similar mechanism, perhaps, must be explained the picture of dermatitis herpetiformis. The eruptive phenomena of this disease have many features in common with erythema multiforme and are always a symptom of systemic intoxication.

Going a step further in our speculation, vaccination connects this group symptomatically with pemphigus. The picture of postvaccinal pemphigus is well known. Yet there are similar eruptions without the previous experience of vaccination. By analogy, therefore, and from presumptive clinical evidence, one might imagine a loose relationship between pemphigus and the erythema group, each perhaps pathognomonic of some blood-borne agent, a chemical or microorganism. The kidney destruction in each differs only in degree, and is significant. Death may and does occur in each, and is invariably a picture of exhaustion or terminal infection, the result of an injurious agent acting over a period of time.

The papulonecrotic tuberculid is spectacularly significant, and the skin in this instance reflects the individual's biologic relationship to the tubercle bacillus as truly as certain syphilitic lesions do to the spirocheta pallida. Occurring before the age of six months, the papulonecrotic tuberculid predicts death from miliary tuberculosis as surely as certain vegetations forewarn of cardiac failure. With other types of tuberculids at different ages the outlook is different. The type of tuberculid depends upon the location of the reaction in or under the skin, or in the vessels in or under the skin. The severity of this depends upon the individual's previous experience with the organism, and his ability to marshall immunization forces which such invasion of the body has previously stimulated.

Rist, the well known authority, remarks, "It is impossible to reflect on the anatomic and clinical evolution of human tuberculosis without meeting the problems raised by a study of the tuberculids. One must recognize that no general conception of tuberculosis infection will be legitimate, if it does not take into consideration the question of the tuberculids or fails to give a satisfactory explanation of them."

Not all cutaneous changes which may be of aid in our recognition of underlying processes are generalized in their distribution. Whether because of continual exposure to trauma, or because of the vascular supply peculiar to the part cannot be stated, yet the palms and soles may present irrefutable evidence of an underlying systemic disease. Chronic arsenism reflects its presence in these locations in the form of peculiar conical, horny plugs which, once recognized, can never be mistaken for any of the ordinary types of hypercornification. Again, in the syndrome of pellagra, the subacute inflammatory reaction, the sharply demarcated pigmentation, and the consequent exfoliation are evidence as valuable as the symptoms of intestinal or mental disturbances.

The lesions of xanthoma have these locations as sites of election, occurring as large or small discrete and confluent reddish yellow plaques. Microscopic examination reveals large collections of swollen connective tissue cells, changed by their absorption of cholesterol from the blood-stream. When present they are as indicative of a faulty sugar metabolism as positive readings in the blood or urine.

In conclusion, then, may it be reiterated that the stimulus of this paper has not been that of overenthusiasm as to the importance of a certain branch of internal medicine. Rather is it hoped to emphasize the close relationship each specialty must bear to the others, and to its parent greater division of morbid anatomy; to suggest perhaps that by the term "dermatology" is really meant "cutaneous medicine."

INDUSTRIAL MEDICINE

ITS DEVELOPMENT AND RELATION TO STATE MEDICINE*

N. R. Wallentine, M.D.
SANDPOINT, IDA.

This subject is one which I believe is or should be of vital interest to every practicing physician, a subject on which much might be written, but I shall endeavor to give merely a brief outline of past developments and what they portend for the future. Industrial medicine and surgery is a combination of preventive and curative medicine, applied to groups of working men and women. In its broadest scope, as practiced in a number of large industries and in a few smaller ones, often combined in groups, it covers every branch of preventive as well as curative medicine and surgery.

There are still a great many industrial concerns in the United States employing company doctors on call to treat the injured employees, and nurses to render first aid, these cases being later referred to some outside physician for further treatment. There are many that have established so-called welfare departments with a little medical service incidental to welfare work, or that are endeavoring to furnish medical service to their employees by using only the cheapest and, therefore, the most incompetent physicians and nurses. Such inadequate medical service in industry must not be confounded with the comprehensive industrial medical and surgical departments advocated by the leaders in this specialty, which represent the ideals and standards of the American Association of Industrial Physicians and Surgeons.

Unfortunately, in various parts of the country many forms of contract practice have developed, which are camouflaging under the term "industrial medicine." These pseudosystems are giving the wrong impression to reputable physicians in these localities, as to exactly what is meant by industrial medicine and surgery. This is resulting in certain discriminations being made against the industrial physician who is actually practicing the highest form of medicine, namely, preventive medicine and surgery. Weeding out these inadequate systems by contrast is the one form of cultivation necessary, after all, to the ultimate development of this specialty.

For example, in some localities doctors, often employed by insurance companies, have taken charge of the medical work in several industries. They have established first aid stations and placed nurses in charge. In other instances the concerns have employed nurses directly, thinking this to be the first essential in establishing a medical department. These nurses are actually practicing medicine, as their first aid work includes the suturing of lacerated wounds and removal of foreign bodies, etc. This is not justifiable because too often the cases are not seen by the doctor until they become serious. Naturally many of these cases drift to other doctors in the community who, on learning that a nurse has treated the case practically without any supervision from a surgeon, condemn such practice and with it all industrial surgery.

Scattered throughout the country are industries, including department stores, which have established medical departments evidently only for their own selfish purposes. Their physicians examine all applicants for work but are not allowed to tell the applicant what ails him, if he is rejected, nor to suggest treatment. As a result, those diseased people go elsewhere, obtain employment and often endanger their own lives as well as all with whom they come in contact. Naturally such narrow-visioned practice places their medical departments in bad repute with the employees and with the outside physicians who come in contact with their employees.

In recent years surgeons have entered into contracts with insurance companies to render medical, surgical and hospital service to all employees for a certain percentage of the premium paid by such industry. Every case which lingers in the hospital for any length of time reduces the surgeon's income. A case with a severe crushing injury, which may take months of treatment and hospital care if the limb is to be saved, can be discharged from the hospital and from further treatment within a few weeks, if the limb is amputated. It takes a broad gauged and very conscientious physician to decide always for the best interests of the patient, when such a decision often means a marked reduction in his income.

There are also insurance concerns operating under the Workmen's Compensation Act which, by their arbitrary action in cutting medical fees in given cases, would almost compel the physician to follow a like procedure or look to the workman for his fee. This form of contract practice is so foreign to the usages and ideal of the profession, that many condemn industrial surgery, judging the real by this false standard.

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Cooperative systems of industrial medicine have been developed in many localities, especially in the West. Many of these cooperative plans furnish the highest standard of medical service, but many others are gauged too much by the financial returns. These latter are condemned because too few physicians are employed to care for the number of employees or, in order to realize the greatest financial returns from such a plan, the chief surgeon too often employs very cheap help to conduct the general practice and after care of his patients. Naturally physicians in these communities, deprived of the usual competition for these cases and seeing the inadequate service furnished by the contract physician, condemn the whole system and with it all forms of industrial medicine.

A great many concerns seem to think that all that is necessary to install a medical service is to employ a doctor. Any doctor will do, the cheaper the better. As a result, a great many undertrained physicians, failures in the regular practice of medicine, have accepted positions with these industries at salaries below those paid clerks in the same concern.

As long as the management of industrial concerns fails to realize that specially trained and extremely competent physicians and surgeons are necessary to carry on a properly organized medical service, and as long as doctors are willing to work for these industries on salaries far below what they actually should be paid, just so long will the profession at large condemn this type of treatment. Such industries furnish medical service in name only; they fail to contribute their share toward the protection of the lives and limbs of the great industrial army.

Recently in Idaho the fees paid by the State Insurance fund have been so low and the arbitrary manner of the manager of that fund in cutting fees has become so intolerable, that the respectable part of the profession have rebelled and almost refused to handle cases insured under this fund. The manager of the fund, seeing conditions, met with a certain county society and threatened to import a physician into the locality for the express purpose of caring for their cases. Before he left town a member of this society went to him and said, "If you are going to import a man to care for the State Insurance Fund cases, let me be that man." These are the things which disgust the respectable physician with industrial practice, but they are merely obstacles to be overcome.

The solution to these problems is to educate the profession in what is included and what is expected of it in a truly comprehensive system of industrial medicine, to educate both employers and employees in the type of service they should buy and demand, to teach the employer that the higher type of well trained physicians will give him the best service and therefore the greatest financial return, and in the end that cheap medical service means the greatest outlay; and above all to give the working men and women the same high standard of medical care that their employers invariably secure for themselves. This means the conservation of our industrial army which is the foundation of our nation's existence.

In 1912 Workmen's Compensation Acts came into effect in many states and under the spur of necessity the surgical risk of industry began to receive attention and corrective action. This action in a number of the larger factories took the form of establishing a safety engineering department and a medical department. The object of the former was to prevent, the object of the latter to treat accidents arising out of employment. In planning how these departments should be organized, medical advice was sought, and under the stimulus of the new problem the science of industrial medicine began to develop. The scope was gradually broadened with the treatment and after care of accidents as a beginning. Physical examinations, diagnosis and treatment of sickness, control of sanitation, general publicity on health matters, housing and food have rapidly become a part of the industrial physician's work. Industry has adopted the physician not from altruism but because the practice of preventive medicine is sound business economics and the factory which has once established a health department has never been known to give it up. Even during the short time industrial medicine has been practiced great advances have been made, and medical schools are now establishing postgraduate courses in this special line of work. The fact that industry has made substantial contributions to these courses is the best evidence of its belief and interest in the subject.

The history of the development of industrial medicine and surgery in the United States is the history of great advancement in public health measures in general. It has been directly responsible for some of these advancements and closely linked with allied public health movements. This specialty has been responsible more than any other agency for the growth in preventive medicine and preventive surgery which has received such a marked impetus in recent years. This form of public health service was rarely mentioned prior to about seventeen years ago, but today it is receiving the attention of engineers, physicians, economists, sociologists, psychologists and the great employers of labor in general. Medical and engineering schools are teaching students various plants of industrial hygiene. The influence of this work is seen in the numerous new laws for the betterment of sanitary conditions of workmen which state legislatures are enacting yearly. Few subjects have received such widespread attention or have reacted for the greater good to the nation in so short a time.

A study of the report of the Department of Commerce and Labor for 1909 and of the various state labor laws reveals the fact that only twenty-one states had laws bearing directly upon the subject of factory and workshop sanitation. A majority of these laws were indefinite and their enforcement did not improve conditions to any great extent. Since that date, practically every state in the Union has enacted laws seeking to improve the working conditions of employees. Forty-two of our states now have laws on employees' compensation, some of which include occupational diseases as a cause for compensation.

From 1890 to 1910, efforts to improve health conditions for employees was left largely to state factory inspectors, usually political appointees and their assistants. Their work dealt chiefly with the plant. With only a few exceptions, company doctors prior to 1910 were not expected to devote much time to health matters. Extending inspection to the employees themselves was one of the greatest advances ever made in health supervision in this country. One of the first examples of careful effort towards health supervision was in 1906 by Dr. Frank Fulton in Providence, Rhode Island. In 1909 Mock, of Chicago, worked along similar lines with employees of a large mail order house. During the next few years similar efforts were made by a number of other workers in this field, until by 1914 physical examination of employees was a fixture in many industries.

The first recognition of this new specialty was received from the National Tuberculosis Association in 1914, when Theodore Sachs, Britton and Mock presented the subject of "examination of employees and the results" before the national meeting of that organization at Washington. This gave a marked impetus to this branch of industrial hygiene throughout the country. Later in that same year the National Safety Council, which had just been organized with a number of industrial surgeons as charter members, formed its health service section, which has been instrumental in spreading the gospel of improved sanitation to so many of our large industrial concerns. Likewise, during the fall of 1914, the American Public Health Association recognized the influence of this form of public health work by organizing the Section of Industrial Hygiene in that organization.

Contract practice, as carried on by the average company doctor, had been frowned upon before this by the A. M. A., but public recognition of the more comprehensive form of industrial medicine was awarded in 1915 by this association. In the annual meeting of that year the Section on Preventive Medicine and Public Health of the A. M. A., Dr. Otto Geir, Chairman, devoted an entire session to this subject. Since then some phase of industrial medicine and surgery has been represented on every annual program of that section. Thus the higher professional standard which industrial medicine has attained is testified to by this recognition on the part of leading members of the profession.

In 1915 the Federal Government took its first step in recognizing this specialty by forming the Division of Industrial Sanitation in the United States Public Health Service. In 1916 Congress created the United States Employees Compensation Bureau, covering employees of the Federal Government with the same protection offered employees in industry.

Following the war the Federal Government passed the Rehabilitation Law which gives a certain amount of money to each state that passed a similar law, for rehabilitating the disabled in industry. New Jersey, Rhode Island, Illinois, Pennsylvania and Idaho have already passed this law. Likewise during the war the different government bureaus took up problems connected with the health and safety of workers. In fact, so many different medical activities were adopted as a part of the war program, that great attention was focussed upon this new branch of medicine during the years 1917 to 1919. This accounts for the rapid growth of this work during the last few years.

We now have both national and state organizations of industrial physicians, numbering between two thousand and three thousand members. These organizations have materially raised the standards of physicians in industrial practice. The annual meeting of the National Association is held at the time and place of the meeting of the A. M. A. In this way it has the benefit of the influence of the leaders of the profession, and it has likewise contributed to the broader vision of the parent organization along medicosociologic lines.

During the years 1920 and 1921 further recognition of industrial medicine and surgery has been witnessed as an active participant in the advancement of the medical profession. For example, the American College of Surgeons appointed a committee on Industrial Surgery, with Dr. Edward Martin of Pennsylvania, as chairman. The purpose of this committee is to see how the college can further the efforts of the industrial surgeons to improve the professional care received by injured employees. Another example is the prominent part which has been accorded to the American Association of Industrial Physicians and Surgeons in the organization of the American Conference for Hospital Service. In August, 1919, this organization, composed of fifteen representative national medical associations, was created as a great coordinating body for the purpose of improving and standardizing hospital service and, with the hospital as the center, to extend medical practice into the social and economic life of every community. Dr. Frank Billings, of Chicago, the representative of the A. M. A., was the first president of this new organization. The Conference includes the American Medical Association, the American College of Surgeons, the American Catholic Hospital Association, the American Public Health Association, the American Hospital Association, the American Association of Industrial Physicians and Surgeons, and the Association for Medical Education.

Several states are now considering legislation dealing with the new employees compensation laws and with the rehabilitation of the injured workers, which includes more and more the principles of industrial medicine. Just as a few years ago we witnessed the evolution of the company physician caring only for the injured employees into a broader field of industrial medicine, so today we are witnessing another evolution, a change from industrial medicine as applied to individual industries into the still broader field of medical economics.

Medical economics embraces all the principles of industrial medicine and in addition it looks forward to the health and working ability of the coming generation and reaches out to reclaim the hundreds of thousands of human derelicts, victims of industrial accidents or disease. Medical economics includes the maintenance of the entire man power of the nation for the purpose of maximum production. Such man power must be happy and contented, as well as healthful to be effective. Viewed in this light, the industrial surgeon of the future must extend his efforts beyond the limits of the individual industry and the immediate health of its working force. He must become an active participant in every movement providing more and better man power for his industry in the future.

That the best hospital service and medical advice in a community is available only for the very poor, who receive it as a charity, or for the well-to-do who can buy it is common knowledge. Medical economics demands the same service for the working men and women and for their children, not as charity but as a service within their reach. Every industrial surgeon knows that there is constant wastage in industry, due to the sick employee remaining at home under inadequate medical care, because the diagnostic and treatment facilities of the hospital are beyond his financial ability to meet. This knowledge has caused most industrial surgeons to take a more active interest than their fellows in the problems of health insurance and state medicine or some other means of meeting the situation. They realize that some inadequate form of health insurance or state medicine will develop in this country unless we as a profession solve this problem, for it must be met. A greater number of moderate priced hospital beds is the crying need today.

The leaders in the profession, whether engaged in industrial practice or otherwise, recognize the deficiencies of the medical service furnished, as a rule, to the working man and woman in industrial communities of the land. They have devoted much thought to the correction of these conditions. Community health centers, where preventive measures applicable both to the home and the working place, will be installed, where diagnostic dispensaries will afford complete physical examination to all in the community, where properly equipped hospitals will meet every need for the most advanced scientific care of the sick and the injured, where all the physicians furnishing this service will be paid a regular, just fee. This will be, in the judgment of most leaders, the final solution of this need. This idea necessarily incorporates with it some form of health insurance which must be worked out by someone. If we leave it to the politicians or laymen we will regret it. If we prepare ourselves adequately by a study of health insurance and state medicine in foreign countries, we will find those countries, in which the profession more or less has organized the scheme, to have the most beneficial and most workable plans.

Industrial medicine and surgery in its most comprehensive form represents the half-way house between the old individualistic form of the practice of medicine and the future community health and medical service. The future of industrial medicine and surgery in the United States, therefore, is more intimately related to the great medical economic problems confronting the entire profession than any other specialty. The solution of these problems will revolutionize the practice of medicine in this country within the next decade. The solution need not be in form of health insurance, as conceived today, nor need it include any of the objectionable features of state medicine or other forms of compulsory medical service, but rather, by a constructive program on the part of the entire medical profession, a solution will be found which will eliminate the wasteful practices of the day and will make available to all that service which will prevent disease, will give the best hospital, medical and surgical care, will vocationally train the handicapped when necessary and will conserve and reclaim the nation's man power.

State medicine in some form, however modified that may be from our present conception, I firmly believe will be the future method of practice. Practically all European countries have it in some form. That form which was brought about in England through the agency of reformers and politicians is the least desirable. That in Belgium, in which the medical profession is practically the ruling power, is probably the most desirable of the many present forms of state medicine. All boards and governing bodies are composed almost entirely of physicians.

Briefly the Belgian plan is as follows. The Labor Medical Service is the head body, composed entirely of physicians. Then come other and lesser bodies, composed chiefly of physicians and druggists, with a representation of laymen and governmental departments. This body or provincial commission determines the organization of the medical services in every detail, including fees.

They maintain three principles: the right of the workman to choose freely his physician, the right of the physician to a satisfactory fee and the right of the patient to prompt, diligent and scientific treatment. To the Labor Medical Service will fall the duty of inspection in this field. The Central Commission will act as a regulating power and an arbitration board; it will constantly strive at improving the qualtiy of the medical services.

In reality this plan is not state medicine, literally speaking, but a substitute therefor and has prevented the formation of a state medical service, as it has been instituted by the workmen in conjunction with the medical profession. It is impossible under this plan to dispossess the physicians of their independence. On the contrary the principle of provincial regulations, laid down by the delegates of the physicians and of the workmen themselves, avoids the enforcement of uniform rules and leaves the door open to any initiative and progress.

In our own country we have at the present time quite a number of laws in force which are primarily sociologic in their action. Some are good and some bad, but on the whole most of them have not been engineered by the medical profession. For instance, the Shephard-Towner maternity bill, the Veterans Relief Act of 1924, state insurance for injured workmen, government insurance for soldiers, and government intervention all along the line show us plainly that the tendencies of the day are toward paternalistic government which eventually will lead to state medicine.

In my own state we have an Industrial Accident Board and a State Insurance Fund which are trying very hard to painlessly insert state medicine into the laws of the state. At our last legislature a bill was sponsored to fine any doctor, who failed to get his industrial accident reports in on time, something like $300. They propose to introduce at the next legislature more pernicious and vicious measures if possible, and if the medical profession is not on its guard state medicine will be upon us before we know it and in its most vicious forms.

If the facts presented in this paper are correct, I believe it would be very unwise for us to underestimate the volume of this tide, and be caught unawares and carried with it, but rather let us take the helm and steer the course into safer waters, which we can do by an intelligent effort on the part of all members of this great profession. Economists, engineers, leaders of both labor and capital are all studying these problems, and we who are the most interested in the final solution should not bring up the rear but should be in the vanguard of the movement.

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BUTESIN PICRATE

AN ANTISEPTIC ANESTHETIC. ITS USE IN EYE, EAR, NOSE AND THROAT SURGERY.*

J. G. Parsons, M.D.
LEWISTOWN, MONT.
From Attix Clinic

An absolute ideal in local anesthetics has not yet been attained. To fulfill all the requirements such a drug must be readily absorbed by nerve elements when applied topically or injected, produce rapid and complete anesthesia, lasting for at least the length of time ordinarily required for operations in which it is employed, be capable of sterilization without decomposition, or itself be antiseptic, be nonirritating and nontoxic.

Cocain is efficient in the production of rapid anesthesia, but is objectionable because of its great toxicity, and is decomposed to a degree by boiling. Novocain is relatively nontoxic, as compared with cocain, said to be about one-tenth as toxic as the latter. It has a very feeble effect when applied topically to mucous surfaces.

Through the courtesy of its discoverer, Mr. Floyd Thayer, research chemist to the Abbott Laboratories, I have had the opportunity of investigating during the past two years, the properties and clinical value of a local anesthetic which he has named "butesin." The picrate of this substance possesses some interesting properties which make it in my opinion a useful addition to our list of local anesthetics.

In Thayer's report to the American Chemical Society he states: Butesin picrate, the picric salt of n-butyl ester of paraaminobenzoic acid, is soluble in water about 1-2000, and in vegetable oils 1-50 to 1-100. It is antiseptic, killing staphylococci in five minutes. Its toxicity in saturated aqueous solutions is very low, 4.5 c.c. per kilo having been injected into the venous circulation of rabbits without deleterious effect.

The aqueous solution dropped into the eye of rabbits produces instantaneous anesthesia of the cornea, lasting about twenty minutes. Aqueous solutions deteriorate, losing half their anesthetic power in two weeks.

It will be noted that butesin is related to orthoform and anesthesin, also to novocain. The paraaminobenzoic element is common to all thus: orthoform, methyl ester of paraaminobenzoic acid; anesthesin, ethyl ester of the same; butesin; butyl-ester of the same; novocain, the hydrochlorate of paraaminobenzoyl diethylaminoethanol.

Butesin is soluble 1-7700. Its hydrochlorate is soluble 1-200, but is very irritating. The picric salt was found by Thayer to be the most practicable form, containing about 37 per cent butesin and 63 per cent picric acid.

CLINICAL APPLICATIONS

Eye. The 1-2000 aqueous solution, producing almost instantaneous superficial anesthesia, makes it useful in the removal of superficial foreign bodies. In the treatment of corneal ulcer it is useful, combining both the antiseptic and anesthetic action. It produces a rapid superficial anesthesia, sufficient for using the tonometer. It does not produce mydriasis. Prior to making applications to the lids it is useful for flushing out the conjunctival sac. It is of distinct value in irrigating the lachrymal tract.

The 1 per cent ointment of butesin picrate put out by the manufacturers is valuable as a postoperative dressing, and in the treatment of burns and ulcers of the cornea.

Nose. The aqueous solution of butesin picrate exerts a beneficial sedative and antiseptic effect in hyperesthetic rhinitis and after nasal operations. For a more prolonged effect, the 1 per cent solution in cottonseed or almond oil is preferable.

A use for the 1 per cent ointment which I have found of great value is that of impregnating gauze which is employed in packing the nose after septum or antrum operations. The packing remains antiseptic and is removed with a minimum of discomfort.

Throat. I have used the aqueous solution of butesin picrate as a local anesthetic in a number of tonsillectomies with gratifying results.

Employing the saturated (1-2000) solution of butesin for injection for one tonsil and 1 per cent novocain for the other, I have noted practically no difference in the anesthesia obtained. The distinct antiseptic property of the butsein solution is in its favor.

I have found that a 5 per cent mixture of butesin picrate with aspirin 95 per cent makes a very useful powder for insufflation into the tonsillar fossae after tonsillectomy. The postoperative discomfort is greatly reduced.

As Thayer has pointed out, owing to the deterioration of solutions on standing, they should be freshly made, and used within a very few days. One grain will make four ounces of the saturated solution, quite enough for several tonsillectomies. I seldom use more than 10 c.c. for a single case, but massive infiltration may be safely used, if so desired, with no fear of any toxic results.

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* Read before the Montana Academy of Oto-Ophthalmology, Butte, Mont., Jan. 18, 1926.

Solutions are best prepared by heating the powder in a flask of distilled water. The powder melts, changing to an orange red color and goes into a 1-2000 solution quite rapidly. One grain capsules make a convenient form in which to keep the drug for making solutions as required. The drug is quite inexpensive, as the solutions used are so dilute.

A SIMPLE DEVICE FOR TREATING CERVICAL GONORRHEA

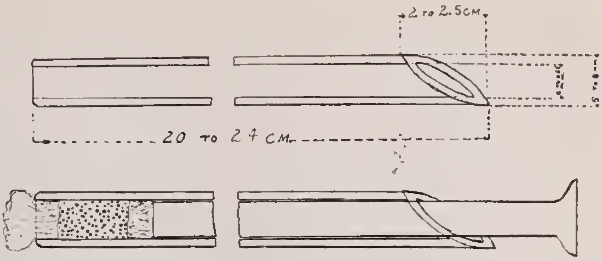
A. POSKA, M.D.
SEATTLE, WASH.

A simple device has proved of such great aid to me in clearing up some obstinate endocervical specific infections that I feel constrained to pass it on for the benefit of others who treat gonorrheal conditions in women. The device consists simply of a section of glass tubing, 20 to 24 centimeters in length, 5 to 8 millimeters in diameter, with an inside diameter of 2 to 6.25 millimeters. One end has a 2 to 2.5 centimeter bevel, while the opposite end is ground square with the sharp edge rounded off. The beveled end is designed to facilitate loading of the device and to minimize the soiling of hands or clothing with the medicament.

A glass rod for the larger sizes, and the long round wooden applicator for the small sizes to act as a plunger, complete the apparatus. This device has the advantage of depositing medicaments in the structures affected, in a form far superior to those at present employed, and has proved of marked assistance in shortening the attack of cervical gonorrhea.

The tube is carefully dried, a small pledget of cotton is forced through the tube and packed tightly in the square end. From .05 to .15 gm. of the medicament is then introduced with the aid of a waxed powder paper, and another small pledget of cotton introduced with the aid of a suitable plunger.

The method of treatment is equally simple. The cervix is swabbed off with a saturated solution of sodium carbonate; the cervical canal is cleaned with the same solution on small swabsticks, carefully dried, and usually a 20 per cent solution of nitrate of silver applied, followed by tincture of iodine. The canal is again dried and, the pledget of cotton having been removed from the end of the tube, it is applied to the cervical canal and the contents expressed into the cervix. The small pledget is allowed to remain in the cervix, acting as a plug and thus retaining the medicament in the canal.



A device for treating cervical gonorrhea.

A cotton tampon is placed against the cervix, and this held in place by a lamb's wool tampon, and the whole allowed to remain until the next morning, when the permanganate douches are resumed. Occasionally Battey's solution is used alternately with the nitrate-iodine treatment.

The medicament consists of mercurochrome, 220 crystals, finely pulverized to prevent packing in the tube, or neutral acriflavine either in the powder form or in the well-ground tablet. The objection may be raised that the introduction of this amount of a mercurial preparation in the cervix may possibly cause toxic symptoms, but when it is remembered that far larger amounts are introduced directly into the blood stream without harm, it will be seen that the objection is groundless. In an extensive use of this method covering a period of several years, it has not in a single instance produced any untoward effect.

The greatest criticism to which this method is open is that, due to the moisture in the cervix, the medicament packs in the end of the tube. This may be easily overcome by using a small amount of medicine proportionate to the diameter of the lumen of the tube. There is nothing to be gained by using the larger amounts.

The tubes can be made in the office. They take but a few minutes to make and last indefinitely. A tube of proper length is cut with a file, and the bevel made by cutting the tubing on the coarse side of a No. 110 carborundum combination stone, finishing on the fine side. The sharp edge is likewise worked off on the stone. Three-in-one oil is used as a lubricant. It is surprising how easily the glass works on this stone. The tubing may be obtained from any scientific supply house. It is sold by the pound, and fifty cents worth will last several years.

SOME ATTRACTIONS OF SPOKANE

At the conventions of the Washington State Medical Association and the Pacific Northwest Medical Association, to be held in Spokane June 29-30, and July 1-3 respectively, delegates will find a city where hospital facilities are without parallel in a city of the 130,000 class. Three first class hospitals, with modern buildings and the very latest in equipment, are what the visiting delegates will find in Spokane.

SACRED HEART HOSPITAL

Sacred Heart Hospital was established by the Sisters of Charity of Providence in 1886. It was located at Front Avenue and Brown Street, and started with a capacity of less than fifty beds. This was the only hospital in a wide extent of territory and received patients from Coeur d'Alene region and often from British Columbia. In a few years the demands for hospital service were increased to such an extent that a new wing was added, in 1901, making it an up-to-date institution according to the demands of the day.

In the early days of the hospital ground was purchased which is occupied by the present hospital. Construction was begun on the new building in 1905, but it was not formally opened until 1910. It was built and equipped to care for about two hundred patients. A new wing was added in 1923, making the present accommodations for three hundred forty patients. The institution is modern in every respect, equipped with all the departments of an up-to-date hospital.

In 1899 a training school for nurses was instituted, starting with a small number of students trained by a few doctors. Subsequent additions to the hospital also provided space for the training school, which has expanded until it now includes one hundred and twenty nurses.

ST. LUKE'S HOSPITAL

St. Luke's Hospital was incorporated in September, 1897, under the name, Spokane Protestant Sanitarium. It was located in a frame building on a down-town street, and contained eleven beds. In September, 1900, the name was changed to St. Luke's Hospital. In June, 1904 the present site was secured and the first unit of the new hospital was built, the capacity being increased to twenty-three beds. Additions have been completed from time to time, increasing the bed capacity and adding modern surgeries. In 1916 the hospital consisted of three stories and basement, with capacity for 100 patients. That year a fire destroyed the top story, decreasing its capacity to seventy-five beds.

The present capacity of the hospital is 172 patients, with three major and three minor surgeries, with complete x-ray and clinical laboratory facilities. The fourth floor is devoted to obstetrics, which cares for 30 patients. Last year, about 4000 patients were received in the hospital. About $500,000 is invested in the plant, exclusive of furniture and fixtures. The staff is composed of forty individuals, distributed among its different departments. The training school for nurses contains 100 students. The hospital occupies a commanding site, overlooking the city, Spokane River and various other scenic views.

DEACONESS HOSPITAL

The Maria Beard Deaconess Hospital was established about thirty-one years ago, having evolved from the work of two visiting deaconesses. They rented a small wooden building at Third and Howard Streets, from which small beginning has developed the present hospital with a capacity of two hundred beds. The second stage of growth consisted of the erection of the large double front building now used as the Deaconess Home. This gave a capacity of twenty patients. Later a brick building was erected increasing the hospital capacity to fifty patients.

The present fire-proof building was erected in 1919. It is a completely furnished up-to-date hospital structure. Besides the general hospital equipment it houses the training school for nurses with ninety students. The sixth floor contains five surgeries, x-ray, physiotherapy, laboratory, pharmacy, delivery and record rooms. The fourth floor is devoted to obstetrics, with thirty adult and thirty nursery beds. It also contains the pediatric department with fifteen beds for children. In 1925 the hospital cared for 4006 adult patients and 516 babies were born. The medical staff comprises forty-five members. Last year the training school graduated twenty-five nurses.

EDGECLIFF SANATORIUM

Edgecliff Sanatorium is a Spokane county institution for care of pulmonary tuberculosis, located six miles east of Spokane. It was opened in the fall of 1915 with a capacity for 50 patients. New buildings have been added from time to time, enlarging the capacity to 150 beds. These consist of administration building, two pavilions for ambulatory patients, one for children and hospital building for bed patients. An open-air school room is attached

Sacred Heart Hospital.

to the children's building. Including the furnishings, the institution has cost about $300,000. The budget of the county allows about $100,000 for maintaining the institution. There are employed fifty-eight people, including two physicians and eighteen nurses. Patients from Spokane county are given preference in admission and pay according to their circumstances. The state allows $5.00 per week for all patients who are unable to pay.

Spokane is well situated for holding conventions, as it is the largest railroad center between the Twin Cities and Puget Sound, with seven transcontinental lines and twelve branches, and is the center of a comprehensive system of improved motor roads, radiating to the coast districts and to the south, north and east. It is the gateway to the Canadian Rockies and lies midway between Glacier and Yellowstone National Park on the west, with the Rockies and the Cascades as eastern and western outposts.

A visit to Spokane itself is worth more than a passing thought. It is well to pause and consider that this bustling community with all the elements that go to make up a metropolis has been created from virgin frontier within the span of a single life. Barely fifty years have passed since the first settler erected the pioneer cabin on the city's site.

Fifty years ago Governor Stevens, pioneer administrator of the Federal government in Washington territory, stood beside the lower cataract of the Spokane River and said to an aide, "Some day this will be a great grist milling center." From the same viewpoint today one is impressed with the

St. Luke's Hospital.

Deaconess Hospital.

One of the many lakes surrounding Spokane and vicinity.

wonderful manner in which this forecast has been fulfilled.

Aside from its reputation as the City Alluring, set amidst pine encircling hills, with its broad clean streets, beautiful architecture, lack of tenements and slums, reflecting healthful citizens, Spokane is noted as the Power City. The development of hydroelectric power will impress the delegates. The turbulent Spokane River, which flows through the heart of the city, has a fall of 1280 feet in the hundred mile dash from its source in Coeur d'Alene Lake to the Columbia River. Seven plants in and near the city produce nearly 200,000 horsepower of electrical energy.

Delegates to this convention will have time to play in "The Green Summer Playground." Before, after or even between sessions there are many trips that can be taken. Within fifty miles of Spokane there are seventy-six named lakes, all easily accessible over good highways.

Immediately to the east of Spokane and extending thirty miles to Lake Coeur d'Alene in Idaho is the Spokane Valley, a remarkable area of intensively cultivated orchards and gardens. Charming homes are scattered thickly through this territory and many small towns with their community centers speak volumes for the enterprise and prosperity that rules in this, Spokane's most rapidly growing suburb.

Four picturesque lakes form the northern, southern and eastern boundaries of the valley add greatly to its popularity and attractiveness. These will appeal to the visitors. Perhaps the best known of these lakes is Liberty, because of its short distance from Spokane's busy business center, only sixteen miles, reached by two highways and by excellent electric service. Good bathing, fishing and boating, also golf, can be enjoyed. For those who enjoy dancing, splendid pavilions have been built at many of the lake resorts.

One of the many scenic features which Spokane will be proud to show her visitors, is the trip to Mount Spokane, thirty-five miles from the business center to the very summit. This is the only municipally owned mountain in the United States. Here a view is presented of many silvery lakes, great ranges of mountains in eastern Washington, northern Idaho and parts of British Columbia, a spectacle ever to be remembered.

At an elevation of 5,080 feet a panorama at once beautiful and impressive is unfolded. An odd feature about this mountain is the fact that only a few hundred feet below the actual summit a splendid, never-failing spring of purest cold water bubbles forth. Still nearer the top is another, although smaller spring. Two hours after leaving Spokane one may view the wonderful panoramic scenes from the top of the peak without ever once leaving his automobile.

Spokane has three golf courses, two private and

View of Spokane, showing Mount Spokane in the distance.

one municipal, which might appeal to the visitors. The municipal course is at Down River Park and can be reached either by automobile or street car service. It has eighteen holes, picturesquely located amidst the pines near the river.

The Spokane Country Club has also an excellent eighteen hole course nine miles north of the city. The course is very delightful, being located among the many small pines. The Manito Golf Club has also an eighteen hole course, actually in the city limits. The Hayden Lake links, thirty-five miles east of Spokane over excellent roads, is a sporty eighteen hole course. One of the most enjoyable trips is to beautiful Hayden Lake, a veritable mountain gem. After the game a plunge in the lake can be enjoyed and a dinner at the famous Bozanta tavern.

Many side trips can be taken which include the following: Long Lake hydroelectric plant, forty-three miles from the city, is the second largest spillway dam in America with a waterfall greater than Niagara. The plant develops 90,000 horsepower. The return trip can be made along the picturesque Spokane River and through a pleasing agricultural district. Good fishing may be had in stretches of the river. This is thoroughly enjoyed by many visitors to this city.

Deep Creek Canyon is regarded as one of the most interesting points in the district for persons interested in geology. The geographic history of the district is revealed in the canyon walls, where erosion has cut an enormous figure.

A modern silver fox farm is two miles east of the city limits, owned and operated by the United States Silver Fox Farm Corporation and is the home of several hundred pairs pairs of registered and pedigreed silver foxes. This is an interesting trip for visitors.

Spokane itself has many attractive features. Natatorium Park, "Spokane's Playground," offers many recreational features — swimming pool, picnic grounds, dancing, enjoyed by residents and visitors.

Spokane is proud of its parks. It is the city's boast that it possesses a larger park area than any community in the United States in proportion to the population. The total acreage of parks is 2,200. There is a park or playground within five minutes walk of every Spokane home. There vary from the beautiful sunken gardens, such as found in Manitou Park, to the rugged and picturesque palisades of Indian Canyon.

Spokane possesses what is potentially one of the finest tourist camps in the Pacific Northwest. It is located a few miles from the business district. Sanitary conveniences are excellent. City water and electric lights are provided.

Spokane's hotels are of the best, where reasonable rates exist. Delegates to the medical conventions are invited to come and play in the "Green Summer Playground."

LEAD POISONING IN NURSING INFANTS. Herbert B. Wilcox and John P. Caffey, New York (*Journal A. M. A.*, May 15, 1926), report two cases of lead poisoning in nursing infants, due to the use of lead nipple shields. Neither infant was fed from nursing bottles. Lotions and ointments were not used on the breasts in conjunction with the breast shields. Neither infant received treatment with lead-containing plaster or dusting powder. Careful questioning failed to reveal any source suggestive of lead toys, inhalation of lead dust, lead impregnated clothing, or of lead foreign bodies in the stomach. The clinical picture in both cases was that of vomiting, meningeal irritation and anemia. None of the manifestations in the classic lead triad was present—colic, palsy and the presence of a lead line in the gingival mucous membranes. This suggests that, in nursing infants, lead poisoning is probably too seldom considered as a diagnostic possibility when such common symptoms as vomiting, general nervousness and anemia constitute the clinical picture. The history of a source of lead, basophilic degeneration of the red blood cells, the changes in the spinal fluid, and the chemical detection of lead in the excreta were most valuable aids.

NEW ADVERTISMENTS

Attention is called to the following new advertisements in this issue. The University of Washington Postgraduate Medical Course is presented on page 14. Jefferson Medical College of Philadelphia (page 339) announces its annual session, beginning September 22. Brown Press announces publication of Plank's Actinotherapy and Allied Physical Therapy (page 34).

NORTHWEST MEDICINE
The Journal of the State Medical Associations of Oregon, Washington, Idaho and Montana
Devoted to the Interests of the Medical Profession of the Pacific Northwest

Editorial Office, 543 Stimson Building, Seattle, Wash.

JUNE, 1926

EDITORIAL

THE SYMPOSIUM

There is a growing tendency in arranging programs of medical meetings to group closely related subjects in the form of symposiums. At the recent meeting of the American Medical Association in Dallas there were no less than four such groupings, a symposium on the treatment of carcinoma of the bladder, one on sympathectomy, one on cardiovascular hypertensive disease and its treatment, and one on chronic nonspecific infections of the lungs and bronchi in children.

Such programs are valuable and should be encouraged. It is difficult to write upon any disease a paper which will be comprehensive enough to approach it from its various angles. It is even more difficult to hear a man deliver such a paper. But when several men investigate the various phases of a subject and each one writes a carefully prepared report of his findings with perhaps the addition of personal experiences and conclusions, it is a very different matter. The effect becomes that of a condensed course of lectures without the monotony of a single delivery, a synopsis from different points of view, a carefully prepared discussion, a monograph. The occasional repetition only serves to emphasize the outstanding facts and the differences in methods of treating the subject, in diction and in expression, keep up the interest of the audience.

For some time the practice of medicine has been undergoing what may be termed a process of decentralization, due to increasing specialization. The next stage in its evolution is apparently a realization of the necessity of correllating the information gained by the various specialties and focusing it again upon the patient as he appears before the general practitioner. The general practitioner has referred his difficult cases to the specialist; the specialist is now reporting his conclusions for the benefit of the general practitioner. It is another evidence of the steady progress of the healing art. Let us have more symposiums.

PROGRAM OF SPOKANE STATE MEETING

The committee in charge of the Washington State Medical Association meeting at Spokane has completed arrangements which they consider will make this one of the most attractive and pleasing meetings of the organization. The program, published below, presents the papers which will be read at the meeting. Arrangements have been perfected for entertaining the visittors which will insure them an enjoyable visit to the city and one which will be long remembered. Hotel reservations should be made early as a large attendance is anticipated.

On June 28-29 will be the annual meeting of county health officers. It is expected that every county health officer of the state will be present at this meeting. The tentative program of this meeting and some of the subjects to be discussed are herewith presented.

TUESDAY, JUNE 29

9:00 a. m. Board of Trustees.

9:30 a. m. House of Delegates and Committee.

11:00 a. m. "Pituitary Syndromes" (with lantern slides), Dr. H. Lisser, San Francisco.[1]
Discussion by Dr. J. M. Blackford, Seattle; Dr. L. S. Gilpatrick, Spokane.

12:00 noon Public Health League Luncheon and General Meeting.

2:00 p. m. "Surgery of the Gallbladder," Dr. S. L. Caldbick, Everett.
Discussion by Dr. A. J. Helton, Yakima; Dr. H. E. Cleveland, Burlington.
"Gastric Lesions," Dr. M. F. Dwyer, Seattle.
Discussion by Dr. C. E. Hagyard, Seattle.
"Abdominal Adhesions," Dr. H. J. Whiteacre, Tacoma.
Discussion by Dr. R. T. Congdon, Wenatchee.
"The Improvement of Our Poor Surgical Results," Dr. John Lyman, Walla Walla.
Discussion by Dr. C. J. Lynch, Yakima; Dr. H. D. Dudley, Seattle.

7:15 p. m. Dinner Dance, Davenport Hotel.

WEDNESDAY, JUNE 30

9:00 a. m. House of Delegates, Election of Officers.

10.00 a. m. "Empyema," Dr. Howard Lilienthall, New York City.[2]
Discussion by Dr. C. W. Sharples, Seattle; Dr. G. A. Downs, Spokane.

11:00 a. m. "Etiology and Treatment of Nonunion of Fractures" (with lantern slides). Dr. C. D. Hunter, Tacoma.
Discussion by Dr. C. F. Eikenbary, Seattle; Dr. L. L. Goodnow, Aberdeen.

2:00 p. m. "Experiences in the Treatment of Tetany with Collip's Parathyroid Extract" (with lantern slides). Dr. H. Lisser, San Francisco.
Discussion by Dr. George Miller, Seattle; Dr. Frederick Epplen, Spokane.

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[1] H. Lisser, A.B., M.D., Associate Professor of Medicine, University of California Medical School; Chief of the Endocrine Clinic, University of California Hospital; Associate Clinical Editor, "Endocrinology."

[2] Howard Lilienthall, M.D., F.A.C.S., Professor of Clinical Surgery Cornell University Medical College, Consulting Surgeon Mt. Sinai Hospital, Bellevue Hospital and a number of other New York Hospitals.

3:00 p. m. "Observations in Disturbed Glucose Metabolism with Etiological Significance." Dr. C. H. Hoffrichter, Seattle.

Discussion by Dr. E. W. Janes, Tacoma.

"Movable Kidney." Dr. Alexander B. Heppler, Seattle.

Discussion by Dr. J. D. Windell, Spokane.

"Application of Physiotherapy." Dr. Clarence A. Smith, Seattle.

Discussion by Dr. Joseph Aspray, Spokane.

7:30 p. m. Smoker.

PROGRAM OF THE COUNTY HEALTH OFFICERS' MEETING

Periodic Health Examinations, Dr. Frederick D. Stricker, Commissioner of Health of Oregon.

Sanitation, Dr. E. T. Hanley, City Commissioner of Health of Seattle. (Dr. Hanley has just returned from an extensive visit to the East, studying sanitation in the large centers.)

Report of the Annual Convention of Child Hygiene in February at Washington, D. C., Dr. E. G. McCornack, Spokane.

The Health and the Public, Mr. Robert O. Jones, Executive Secretary Public Health League, Seattle.

THE JULY MEETING AT SPOKANE

The fifth annual meeting of the Pacific Northwest Medical Association, at Spokane, July 1-3, will probably be one of the notable gatherings of the Pacific Northwest. The impressive list of speakers has already been published and includes men of international repute, whose presence will be sufficient guarantee for the anticipated large attendance. According to the arrangement for the sessions, the morning assemblies will include speakers who have subjects of general interest, while in the afternoon there will be a division into medical and surgical sections, which will meet, however, in adjacent rooms at the Davenport Hotel. The registration fee of $10.00 should be sent to Dr. Frederick Epplen, secretary-treasurer, Spokane.

Attention is again called to the meetings of Pacific Northwest Urologic Society and Pacific Northwest Orthopedic Society, which will meet jointly with the Pacific Northwest Medical Association. Each will have a special session the evening of July 1 with dinner, followed by addresses. Their meetings will be open to all physicians present at other medical meetings. In order to secure suitable hotel accommodations, requests for the same should be sent at an early date to Dr. Geo. H. Anderson, Paulsen Building, Spokane. All railroads have provided for rates of one and one-half fare except the Canadian Pacific. In purchasing your ticket obtain a receipt from your local agent, which must later be presented to the secretary of the meeting in order to obtain the one-half fare return rate.

ATTENTION, MONTANA PROFESSION

This is to remind the members of Montana association and adjacent states of the annual meeting which will be held at Billings, July 16-17. The program was published in our last issue, mentioning the list of distinguished members of the profession who will read papers and lead in discussions. This will be a notable meeting which everyone should plan to attend.

ANNUAL POSTGRADUATE LECTURES

The tenth postgraduate medical course of lectures, under the auspices of University of Washington, will be delivered in Seattle, July 19-23. The lectures this year will be presented in Anderson Hall. This is a beautiful, well arranged building, constructed for the Forestry Department of the University. It will provide the most satisfactory accommodations for the lectures which have ever been offered the students of this course.

The lectures will be delivered by the three following well known members of the profession, whose personal qualifications and national popularity will assure them a warm reception, with the assurance that the best quality of instruction will be imparted by them.

Dr. George Dock, formerly professor of medicine of University of Michigan, Tulane and Washington medical colleges, will deliver the medical lectures. Dr. W. F. Braasch, of the Mayo Clinic, will deliver the urologic lectures and Dr. Wm. F. Rankin, of the Mayo Clinic, will present the surgical lectures. All of these men will deliver a lecture during each of the five days of the course.

Each matriculant for the course will receive a card which will entitle him to the courtesies of the University golf course on the University campus upon payment of the green fee. A banquet for attending physicians and teachers will be held on Monday evening, July 19. Dinners by various alumni organizations will be held on Tuesday evening. A public health lecture, under the auspices of the University, will be delivered Wednesday evening, the place to be announced later.

CANADIAN MEDICAL ASSOCIATION

The annual meeting of Canadian Medical Association will be held at Victoria, B. C., June 21-25. Victoria welcomes you and invites you to make this visit to the city and Vancouver Island the nucleus of a real vacation. A trip up Vancouver Island is worth planning and, if you are a sportsman, you will find it a veritable wonderland of scenery, lakes and rivers.

Various sports will be provided that will meet the wishes of every sort of endeavor. Throughout the week, June 21-26, the Official Button or Badge will give you privileges at the Oak Bay Golf Course, the Colwood Golf and Country Club, the Uplands Golf Course, the Esquimalt Course (9 holes), and the Cedar Hill Course (9 holes). Visiting ladies will enjoy the same privileges. The Victoria Medical Society Golf Club has arranged a Golf Tournament to be played at the Oak Bay links by courtesy of the Victoria Golf Club. This will be held on Tuesday, June 22, and the morning program provides for medal play with full handicap and in the afternoon contest against bogey is planned.

The scientific program of the Canadian Medical Association meeting will commence on Wednesday, June 23, so that one may have a day's play by planning to arrive early Tuesday morning by either Vancouver or Seattle or by ferry if motoring. The British Columbia men may play off early and attend the annual meeting of the British Columbia Medical Association at 3:45 Tuesday afternoon. Intending players are requested to communicate by letter or wire with Dr. D. M. Baillie, Belmont Block, Victoria, B. C.

Both ladies and gentlemen may play tennis by courtesy of the Victoria Lawn Tennis Club. The new Crystal Garden with its salt water pool should not be overlooked. Outdoor fresh water bathing may be found at Elk Lake. Victoria is noted for its wonderful gardens. The Ladies Committee is arranging for visits to these gardens each morning, especially on June 24 and 25. Good horses for riding will carry you among the beauty spots in the environs of Victoria. The city is surrounded by beaches and salt water.

Miles of paved roads radiate in all directions, leading to the celebrated Malahat Drive, to the lakes and rivers, up the island for trout fishing, and others to the Saanich Penninsula and Brentwood Bay, where the salmon fishing is excellent. Famous sunken gardens at the home of Mr. R. P. Butchart on Tod Inlet are a wonder sight which must be seen to be appreciated.

On the evening of Friday, June 25, all Canadian graduates will dine as college units—McGill, Toronto, Queen's, Western, Manitoba—all represented in Victoria, and we are planning for big parties.

PROGRAM

MONDAY, JUNE 21

9:00 a. m. to 12:30 p. m. Meeting of The Canadian Medical Association Council.
12:30 p. m. Council of Canadian Medical Association to be luncheon guests of Dr. Forrest Leeder at the Empress Hotel.
1:30 to 5:00 p. m. Canadian Medical Association Council Meeting.
6:30 p. m. Members of the Council of The Canadian Medical Association to be the guests of The Victoria Medical Society at dinner at the Empress Hotel.

TUESDAY, JUNE 22

9:00 a. m. to 12:30 p. m. Meeting of The Canadian Medical Association Council.
1:30 to 5:30 p. m. Council of The Canadian Medical Association.
3:45 p. m. Business Meeting of The British Columbia Medical Association.
4:00 p. m. Garden Party at Lady Barnard's.
6:15 p. m. Annual Dinner of The British Columbia Medical Association and Election of Officers.
Golf Tournament arranged by The Victoria Medical Society Golf Club, played at Victoria Golf and Country Club, Oak Bay. To play in early part of the day.

WEDNESDAY, JUNE 23

9:00 a. m. General Registration.
10:00 to 11:00 a. m. Official Opening.
Address by President, Dr. David Low.
Address by President-Elect, Dr. Forrest Leeder.
Official Greetings—
The Government of the Province of British Columbia, The Honorable, The Premier Mr. John Oliver.
The City of Victoria, His Worship, May J. Carl Pendray.
11:00 to 11:30 a. m. Dr. Duncan Graham, Toronto, Pernicious Anemia.
11:30 to 12 Noon Dr. Chas. Hunter, Winnipeg. Encephalitis Lethargica.
12:00 to 12:30 p. m. Dr. Chas. F. Martin, Montreal, High Blood Pressure from the Standpoint of the General Practitioner.
12:30 p. m. Official Photograph.
12:35 p. m. Luncheon.

1:15 p. m. Inspection of Exhibits.
1:30 to 2:00 p. m. Dr. Gordon Fahrni, Winnipeg, Symposium—Goitre, Surgical Aspect.
2:00 to 2:30 p. m. Dr. A. H. Gordon, Montreal, Symposium—Goiter, Medical Aspect.
2:30 to 3:00 p. m. Dr. W. D. Keith, Vancouver. Symposium—Goiter from the Standpoint of Prevention.
3:00 to 3:30 p. m. Dr. W. H. McGuffin, Calgary. Symposium—Goiter, Radiologic Aspect.
3:30 to 4:00 p. m. Dr. J. C. Meakins, Montreal. Some Phases of Heart Disease with Special Reference to the Needs of the General Practitioner.
4:00 to 4:30 p. m. Dr. J. O. Thomson, Canton, China. Tumors (illustrated by Lantern Slides).
4:30 to 5:00 p. m. Dr. J. G. MacDougall, Halifax. Empyema.
5:00 p. m. Inspection of Exhibits.
6:30 p. m. Annual Dinner of The Canadian Medical Association at the Empress Hotel.

2:00 p. m. Drive for Ladies. Victoria, Environs, Marine Drive.
4:00 p. m. Reception at the home of Mrs. Forrest Leeder, "Stoneyhurst," Rockland Ave.
8:15 p. m. Arion Club Concert.
9:45 p. m. Visit to Astrophysical Observatory, Saanich Mountain.

Thursday, June 24

9:00 to 9:30 a. m. Dr. Edgar Allin, Edmonton. Surgical Aspects of Acute Abdominal Disease.
9:30 to 10:00 p. m. Dr. J. S. McEachern, Calgary. Prevention, Diagnosis and Treatment of Postoperative Peritonitis.
10:00 to 10:30 p. m. Dr. W. H. Dickson, Toronto. Symposium—Duodenal Ulcer. Radiologic Aspect.
10:30 to 11:00 a. m. Dr. H. C. Moffitt, San Francisco. Symposium — Duodenal Ulcer, Radiologic Aspect.
11:00 to 11:30 a. m. Dr. F. N. G. Starr, Toronto. Symposium—Duodenal Ulcer, Surgical Aspect.
11:30 to 12 Noon Dr. H. W. Hill, Vancouver. The Nonrelation of Malnutrition to the Incidence of Infectious Diseases.
12:30 p. m. Luncheon.

1:15 p. m. Inspection of Exhibits.
1:30 to 2:00 p. m. Dr. Willis Lemon, Rochester. Cooperative Diagnosis and Treatment between Physician and Consultant.
2:00 to 2:30 p. m. Dr. V. E. Henderson, Toronto. The Newer Drugs, Their Uses and Abuses.
2:30 to 3:00 p. m. Dr. L. G. Rowntree, Rochester. Some Phases of Renal Function.
3:00 p. m. Mr. Butchart's Gardens.
4:15 p. m. Guests of Governors of Brentwood College, Reception and Tea.
9:00 p. m. Reception at Government House. Guests of His Honor The Lieut. Governor. The Hon. R. R. Bruce.

Friday, June 25

9:00 to 9:30 a. m. Dr. F. G. Banting, Toronto. Medical Research.
9:30 to 10:00 a. m. Dr. J. G. Fitzgerald, Toronto. The Etiology, Diagnosis, Prevention and Treatment of Scarlet Fever.
10:00 to 10:30 a. m. Dr. Alex Gibson, Winnipeg. Acute Arthritis.
10:30 to 11:00 a. m. Dr. A. J. Grant, London, Ont. Chronic Mastitis.
11:00 to 11:30 a. m. Dr. W. B. Hendry, Toronto. The Toxemias of Pregnancy.
11:30 to 12 Noon Dr. Jas. Miller, Kingston. The Present Position of the Cancer Problem.
12:00 to 12:30 p. m. Dr. Helen MacMurchy, Ottawa. Maternal Mortality.
12:30 p. m. Luncheon.

1:15 p. m. Inspection of Exhibits.
1:30 to 2:00 p. m. Dr. L. J. Austin, Kingston. Injuries to the Elbow in Children.
2:00 to 2:30 p. m. Dr. S. Gordon Chown, Winnipeg. Errors in Diagnosis with Reference to Diseases of Infants.
2:30 to 3:00 p. m. Dr. J. A. Nutter, Montreal. Paralytic Deformities of Childhood.
3:00 to 3:30 p. m. Dr. J. F. Barnhill, Indianapolis. Some General Diseases which have Origin in Infections of the Head.
3:30 to 4:00 p. m. Dr. Ritchie Rodger, Hull, Eng. The Problem of the Acute Ear.
4:00 to 4:30 p. m. Dr. J. B. Collip, Edmonton. Recent Advances in the Physiology of the Parathyroid Glands.
4:30 to 5:00 p. m. Dr. Maud E. Abbott, Montreal. The Sir Wm. Osler Memorial Volume and its Classified and Annotated Bibliographies (Lantern Slides).
4:00 p. m. Garden Party at Hatley Park, the residence of Mrs. Jas. Dunsmuir.
6:30 p. m. Alumni Dinners.
6:30 p. m. Ladies' Dinner, followed by Bridge and Mah Jongg, at the New Crystal Garden.

MEDICAL NOTES

OREGON

Elected Trustee. At the annual meeting of the American Medical Association at Dallas, Dr. Joseph A. Pettit, of Portland, was reelected trustee of the association to succeed himself. He is one of nine trustees who manage the affairs of the organization. Dr. Pettit represents the medical profession of the Pacific Coast and Rocky Mountain states. His election followed a close contest with California for this honor.

Meeting of Northwest Hospital Association. The semiannual meeting of Northwest Hospital Association was held last month at Portland, attended by delegates from fifty-eight hospitals of the Pacific Northwest. The program consisted of papers and addresses from representatives of hospitals, as well as leading physicians of Oregon and adjacent states. Miss Emily Loveridge, superintendent of the Good Samaritan hospital, was elected president for the ensuing year. Vice-presidents elected were Miss Evelyn Hall, superintendent of Seattle General hospital, and Miss Carolyn E. Davis, superintendent of Minor hospital, Seattle.

New Hospital Opened. There was recently a formal opening of the Leep hospital at Bandon. The building is a two story, twelve room structure, remodeled for a hospital from a private residence. The institution represents an investment of $6,000 and will accommodate fifteen patients. Although owned by Dr. Leep, it will be open to the patients of other physicians.

Lutherans to Build Hospital. The Lutheran Synod of the Columbia conference have decided to take over the hospital which has been started in Astoria by the Fraternal Hospital association, located at Sixteenth and Franklin Streets. This association was organized in 1921 for the purpose of building a hospital. About $150,000 has been invested in the enterprise. Since this church organization has gained possession of the property, it is expected the hospital will rapidly progress to completion.

New Wing Planned for Hospital. It is proposed to add a new wing to the Salem hospital with a capacity of thirty beds, the same having been approved by the hospital board. It is estimated this will cost about $60,000.

WASHINGTON

New Hospital Wing to be Built. Completion of the north wing of St. Joseph's hospital, Tacoma, has been authorized. Provision will be made for the accommodation of nurses, together with rooms for doctors, obstetric rooms and nursery. There will be an added capacity for about fifty more patients.

Dr. L. H. Meadows, who formerly practiced at Clear Lake, has moved to Port Gamble, where he will have charge of the hospitals of the McCormick Lumber Company.

Infirmary to be Built. It is reported from Washington that General Hines has approved the construction of a new infirmary building, at Walla Walla, as an addition to the U. S. Veterans' hospital. This addition will cost $200,000. It is expected that this will add about one hundred beds to the capacity of the institution. This will make about $1,000,000 which the government has spent in the construction of this hospital.

Hospital Sold. The Sultan hospital, which for several years has been under the management of Dr. H. W. Bortner, has been sold to Dr. R. G. Nelson, of Seattle, for $8,300.

Pacific Coast Oto-Ophthalmological Society. The fourteenth annual meeting of the Pacific Coast Oto-Ophthalmological society was held in San Francisco April 28-29. The society includes physicians from the Pacific Coast and Rocky Mountain states, as well as British Columbia, numbering about three hundred members. It was voted to hold the next annual meeting at Spokane. Dr. Carroll Smith of that city was elected president for the ensuing year.

Pierce County Antituberculosis League held its annual meeting at Tacoma May 11. The following officers were elected for the ensuing year: President, Dr. W. B. Penney; vice-presidents. Dr. C. H. Kinnear and Mrs. Christen Quevli, all of Tacoma; secretary, Mrs. Charles Hood, Puyallup; treasurer, R. D. McDonald, Tacoma.

Osteopath as Health Officer. There has been much discussion and dissatisfaction with the action of the city council of Colfax which sometime ago appointed an osteopath, Dr. Abegglen, as city health officer. Under the advice of the state commissioner of health, Whitman county medical society voted to refuse to recognize him in his official capacity. Dr. R. J. Skaife was ordered by Dr. Stuht, state director of health, to take charge of the matters of health in the city.

Appointed to Department of Health. Dr. Adolph Weinzirl, of Seattle, has been appointed by Dr. E. T. Hanley, city health commissioner, as assistant commissioner of Health.

Appointed to the Board of Health. Mrs. Frances R. McLaughlin, Seattle, has been appointed by Gov. Hartley a member of the State Board of Health. She will be the first woman who has served in this capacity.

Retires from Office. Dr. J. E. Crichton, of Seattle, has retired as president of the King County Anti-Tuberculosis League after serving for nine years. He was elected honorary vice-president.

Dr. B. V. Mounter, who has practiced for sixteen years at Lynden, has moved to Bellingham, where he will practice for the future.

IDAHO

Appointed Superintendent. Dr. John I. McKelway has been appointed superintendent of northern Idaho sanitarium for the insane at Orofino, succeeding Dr. J. W. Givens, resigned. Dr. McKelway has had long experience in institutions of this character, and has been connected with western Washington hospitals at Steilacoom for the past five years.

Dr. J. W. Givens has resigned as superintendent of northern Idaho hospital at Orofino, having served in this capacity since its establishment twenty years ago. Previous to this time he had been superintendent of the state asylum at Blackfoot. He will make his future home at Boise.

Canyon County Medical Society at a recent meeting elected the following officers for the ensuing year: President, Dr. T. D. Ferrer, Caldwell; Vice-President, Dr. H. B. Belknap, Nampa; Secretary, Dr. S. A. Swayne, Nampa.

OBITUARIES

Dr. David F. Eakin died at La Grande, Ore., April 16, aged 95 years. He was born in Ohio in 1830 and obtained his medical degree in Cincinnati Medical College in 1858. In 1859 he moved to Colorado and prospected for gold during the following year. In 1860 he moved to Iowa, where he practiced for twelve years except for serving as army surgeon for two years during the Civil War. In 1871 he moved to Kansas and in 1882 to Missouri. He located in Los Angeles in 1883. In 1886 he moved to Rockford, Wash., moving to Spokane in 1889. In 1896 he moved to Hillyard and remained there until 1911. Since that time he has lived mostly in Seattle and Portland.

MEDICAL RESERVE CORPS

The following changes of assignment status of members of the Reserve Corps are announced:

Captain Lee Roy MacBurney, Med-Res., 405-6 1st National Bank Bldg., Great Falls, Montana. from General Hospital No. 145, Zone of the Interior.

The following named reserve officer is relieved from assignment to the 96th Division: Captain Earl D. Roger, Med-Res., University Club, Spokane, Wash.

Capt. Albert E. Stripp, Med-Res., 804 N. Broadway, Billings, Montana, to General Hospital No. 145. Zone of the Interior, as Medical Ward Officer.

First Lieut. Walter H. Stephan, Med-Res., 506 S. Pacific St., Dillon, Montana, to 66th Surgical Hospital, 3rd Army, as Assistant Operating Surgeon.

First Lieut. Richard S. Rogers, Med-Res., Junction City, Ore., to General Hospital No. 139, Zone of the Interior, as Medical Ward Officer.

Lieut. Col. Ralph S. Hedges, Med-Res., Boulevard Apts., Lewistown, Montana, to Hospital Center No. 23, Zone of the Interior, as Medical Consultant.

Major Leland Frazier, Med-Res., Rupert, Idaho, from Station Hospital No. 141, C. Z., to General Hospital No. 139, Zone of the Interior, as Assistant to Chief of Medical Service.

Lieut. Col. Ralph S. Hedges, Med-Res., P. O. Box 1803, Lewistown, Montana, from 104th Division.

First Lieut. Walter H. Stephan, Med-Res., Dillon, Montana, from 104th Division.

By direction of the President, and under authority contained in First Indorsement, The Adjutant General's Office, dated April 29, 1926, the following-named reserve officers (Branch Assignment Group) are ordered to active duty for training effective June 13, 1926. On that date each reserve officer will proceed without delay to American Lake, Washington, and, upon arrival thereat, will report in person to the Commanding General, Camp Lewis, Washington, for training. Each officer will rank from the date specified after his name:

Lieutenant Colonel William Carlton Smith, Med-Res., 0-141972, May 30, 1926, 157 South Winter Street, Salem, Oregon.

By direction of the President, and under authority contained in letter from the Adjutant General, dated November 28, 1924, Subject: Training Year, 1925, and General Orders No. 35, War Department, November, 28, 1924, the following named reserve officers are ordered to active duty for training effective June 13, 1926. On that date each reserve officer named herein will proceed without delay to Camp Lewis, Washington, and, upon arrival thereat will report in person to the Commanding General thereof for training. ach officer will rank from the date specified after his name:

Lieutenant Colonel James Tevis Arwine, Med-Res., June 13, 1926. (0-103839. U. S. Veterans Hospital No. 72, Fort Harrison, Montana.

First Lieutenant Earl Chauncey Hall, 0-227808, Med-Res., June 13, 1926. Laurel, Montana.

CORRESPONDENCE

CANTON HOSPITAL CLOSED BY BOLSHEVISTS

(Extract from letter received by Dr. H. V. Wurdemann, Seattle, from Dr. J. Oscar Thomson, Canton.)

Canton, China, April 17, 1926.

Dear Doctor:

I am president of the American Association of South China, and in that capacity am heading the movement to make the political situation here quite clear at home. The Russian Soviet, communist and labor elements, are doing all they can to oust the noncommunists, and to destroy foreign, including American interests, here. I am in a position to know the facts.

I have a standing invitation to go to the "Nanti Club," which is the club organized by the Government officials who are noncommunistic, such as Sun Fo (son of Dr. Sun Yat Sen), Dr. C. C. Wu, Mr. T. V. Sung, and others. I was there last Saturday evening, and chatted with a dozen of the prominent members of the Government who are doing constructive work but who do not at present hold the political power.

There is a conflict on between the communists and noncommunists. Yesterday afternoon the American Consul General, the British Consul General, and the Postal Commissioner were in my house for tea to discuss the local political situation, which vitally concerns all non-Russian foreigners here. If we are not careful, American interests and institutions will be swept away and the place will become Bolshevistic. The meeting of the Kuomintang to be held here next month will probably decide whether conservatism or Bolshevism will reign. At present ignorant force reigns supreme. I am enclosing copy of resolution to publish to show what is going on here. The closing down of the Hospital has brought things to a head.

SOUTH CHINA BRANCH
OF THE
CHINA MEDICAL ASSOCIATION*

At a meeting of the above Branch, held at Canton on April 8, 1926, the following resolution was unanimously adopted.

Whereas:

1. The Miscellaneous Workers' Union did on February 28, 1926, deliver to the authorities of Canton Hospital an ultimatum requiring full acceptance within three days of a series of demands, including the following:
   a. "That before a workman can be dismissed the Miscellaneous Workers' Union must investigate, and the approval of that Union must be first secured."
   b. "That the Hospital must engage as workers only members of the Miscellaneous Workers' Union."
   c. "That the Hospital must require all of its work people to join the Miscellaneous Workers' Union and obey its rules."
2. The Miscellaneous Workers' Union did on March ninth call a "strike," ordering all workers of the Canton Hospital to leave their work and the hospital cial meeting of the Executive Committee of the China premises, thus causing them to break the rules of the hospital and to endanger the lives and the welfare of all within the institution.
3. The Union caused all the hospital gates to be picketed, prevented Chinese, both patients and others, from entering the hospital, prevented food from being taken into the hospital for Chinese patients and staff, and cut off the water and telephone services.
4. On this date, April 8, pickets at all gates of the hospital, armed with clubs, and with the banners of the Miscellaneous Workers' Union fastened to the gates, still prevent Chinese entering the hospital, thus preventing the hospital from functioning, to the detriment of the community, therefore be it

Resolved:

1. That the South China Branch of the China Medical Association hereby protests against the unwarranted and inhuman actions as above briefly related.
2. That this matter be brought to the attention of the Government, emphasizing to it that unless such actions be prevented it will be impossible, with safety to patients and staff members, to conduct efficient medical institutions here, the whole community thereby suffering in consequence.
3. That the Government be notified that at a spe- Medical Association held at Shanghai on March 22, 1926, having heard all the facts, official approval was given to the course of action taken by the Canton Hospital authorities in this connection.
4. That the Government be requested to have all pickets permanently removed from the vicinity of Canton Hospital, and prevent further interference with that institution by the Labor Union.
5. That the Government be reminded that Canton Hospital, having introduced modern medicine into China, has for ninety years served the community as a high-standard, efficient, charitable, medical institution, and that the present condition of affairs will assuredly not receive public approval, either throughout China or abroad.
6. That copies of this resolution be sent to the Commissioner of Public Health, the Chief Commissioner of Canton, and the Commissioner of Labor."

(Signed) J. ALLEN HOFMANN, M. D.
President
A. CLAIR SIDDALL, M. D.
Secretary.

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*This is an international organization with many Chinese members.

REPORTS OF SOCIETY MEETINGS

OREGON

PORTLAND CITY AND COUNTY MEDICAL SOCIETY

Pres., T. H. Coffen: Secty., K. H. Martzloff

A meeting of Portland City and County Medical Society was held at Portland Hotel, Portland, Ore., May 5, 1926. Dr. T. Homer Coffen presiding.

Dr. John Arthur Wild was elected to membership in the Society.

The first paper was presented by Dr. W. H. Brown, director of the Marion County Health Demonstration. His paper dealt with methods of health examination. He briefly reviewed the history of public health work in this country and also brought out what he has attempted to do in Marion County with his child health work.

The second paper, entitled "The Management of Sex Problems in Children," was presented by Mr. Henry Grant. He considered in detail certain sex problems of particular importance to adolescence. He treated his subject in considerable detail and in a most satisfactory and instructive manner.

A regular meeting of the society was held Wednesday evening, May 19, at Portland Hotel, Dr. T. Homer Coffen presiding. Minutes of the previous meeting were read and approved.

The first business of the evening was a report of a case presumably of blastomycosis by Dr. Ettleson.

The R. C. Coffey Clinic presented a case of annular carcinoma of the small intestine, producing obstruction.

Dr. Franklin Johnson read the first paper entitled, "Exstrophy of the Bladder." An interesting case of exstrophy was reported. The doctor took up the embryology of the urogenital tract, giving the probable embryologic reason for this defect.

Dr. H. W. Howard presented the second paper which concerned itself with chronic urethritis and ureteral stricture as popularized by Hunner. He showed numerous lantern slides.

The discussion of both papers was commenced by Dr. A. E. Mackay who was followed by Drs. Hynson, Coffey, Nitscke and Howard.

Dr. Barbee made a motion that the society consider the advisability of having its meetings at the Medical School. This was seconded by Dr. Mackay, and it was unanimously decided to refer the matter to the Council of the Society with the recommendation that the next meeting be held at the Medical School.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., W. C. Woodward; Secty., O. H. Christoffersen

The general meeting of King County Medical Society called to order by the President, Dr. W. C. Woodward, at 8:25 p. m., May 3. There were 86 members and guests present. Minutes of previous meeting read and approved.

The application of Dr. R. N. Somers was read. Drs. Robert Freeman and Harold G. King were elected to membership.

The matter of the revision of the By-Laws was presented and it was voted to adopt the same as previously presented.

Dr. Hibbert W. Hill, Commissioner of Health, Vancouver, B. C., gave a paper on "The Nonrelation of Nutrition to the Incidents of Infectious Diseases." He stated there is no more common phase than that of "lowered resistance." How can you raise resistance? The universal law of living protoplasm is that it will adjust itself to the demands made upon it to a certain point but not beyond that point. "Good health" is not an assurance against all diseases, such as measles, etc. Nor do good good health and physique mean a resistance against the common cold, as is illustrated by arctic explorers who return in the best physique possible to a contact with civilization and immediately contract acute colds and other common diseases. Resistance is not the result of health but of disease. Is it not time to make the statement that, if resistance is lowered, exposure to disease and consequent illness is the result? Resistance is a purely specific instance, and you cannot raise or lower this by good health or physique.

The second paper, "The Findings and Results in 100 Cases of Goiter," was by Dr. Brien T. King. This report was presented to review a personal experience in the surgical treatment of goiter, to tell of mistakes made, and lay emphasis on a few measures which seem most important in the management of the different types of toxic goiter.

It has been interesting to follow certain groups of symptoms and physical findings, particularly the effect on metabolism, as evidenced in altered basal metabolic rates, changes in weight, urinary excretions and blood pressure. The average basal metabolic rate varies from minus 4 per cent in simple adenomata to plus 41 per cent in exophthalmic cases. Loss of weight in thirty-five exophthalmic cases averaged twenty-two pounds. The blood pressure in exophthalmic group average 133 systolic, 76 diastolic; in toxic adenomata systolic 143, diastolic 84.

The eye has been an interesting study. It has been said that exophthalmos does not occur except in true exophthalmic goiter, yet in toxic adenomata there was a suggestion at least of exophthalmos in several.

No phase of the management of toxic goiter so contributes to the safety as proper preoperative preparation and careful judgment in the selection of time for operation. Rest in bed is the most valuable single measure in both types of cases. The differentiation between hypertension associated with the toxic goiter and hypertension due to hypermetabolism has not always been easy. This is important in the final pregnosis, as in cases solely due to hypermetabolism the return to normal is to be anticipated. While the cases associated with essential hypertension are improved, the improvement does not extend beyond the border, where hypermetabolism ceases to be a contributing factor.

The heart and its varied manifestations in the presence of hypertheroidiam has presented the most interesting and disturbing factors in the management of these cases. Hearts have been classified as rheumatic, syphilitic, goiter, associated with and the result of true hypertension, myocardial degeneration. Rheumatic hearts have not as a rule been difficult to differentiate from goiter hearts. The differential points have been in the history, location, pitch and transmission of the murmur. From the standpoint of operative technic, recurrent nerve injuries have caused the most distressing consequences.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. F. Dodd; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in its rooms, Tacoma, April 27. Called to order by the president, Dr. E. F. Dodd, Dr. C. F. Engels acting as secretary pro-tem.

The city health officer discussed the scarlet fever situation and reviewed the work of the Drs. Dick on prevention and treatment. He also questioned the value of fumigation as ordinarily done in the home, and requested the opinion of the society as to the wisdom of discontinuing fumigation as a routine procedure.

A motion was made and carried that a committee be appointed to bring in a report on this subject at the next meeting. The chair appointed Drs. Swearengen, Dayton and Buis.

The first paper was read by Dr. Dayton on "Infant Feeding." He said this subject always presupposed artificial feeding, and stressed the importance of feeding with mother's milk. He gave in detail the best methods of keeping up a supply of breast milk by mammary manipulation and also getting the baby to take it. He mentioned the difference in the baby's stools after changing to cow's milk. Cow's milk, modified by lactic acid, is probably the best substitute for mother's milk. He advised weighing the baby, both to check the amount of milk obtained and its growth.

Loose stools, vomiting, temperature and distress in a baby previously well and healthy are signs of infection, and should not be overlooked as due to erroneous feeding. Beginning menstruation is no indication for cessation of breast feeding. Cod liver oil can be started as early as the first month in dosage of fifteen drops t. i. d., increasing gradually. Discussion by Drs. Turner, Leaverton, Swearengen, Robertson, Hopkins and Gray.

Dr. Buis read a paper on "Nonsurgical Drainage of the Gallbladder." He described the technic of passing the duodenal tube, washing the stomach and testing for acidity and, when the tube had passed into the duodenum, injecting one and one-half ounces of thirty per cent magnesium sulphate solution. This produces relaxation and emptying of the gallbladder. The diagnosis of infection is made by noting the three changes in the color and amount of bile, and finding of leucocytes in the golden yellow bile. This is a definite aid to diagnosis of cholecystitis and frequently relieves all symptoms for a considerable time.

Dr. Leaverton reported for the Publicity Committee that space had been arranged for in the new telephone directory and desired a classification of the society members. On motion this was laid over until the next meeting.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., E. F. Chase; Secty., M. J. Morris

The monthly meeting of Puget Sound Academy of Ophthalmology and Oto-Laryngology was held at Virginia Mason Hospital, Seattle, May 18. Dr. Chase called the meeting to order at 8:00 p. m. Minutes of the last meeting were read and approved.

Dr. Klemptner presented a case of epithelioma of the right ear, which he had previously presented before the Academy. Dr. Smith, who discussed the paper, has been treating this case by electrocoagulation and skin graft. He found it difficult to keep the canal open. The speculum used for this purpose caused irritation and absorption of graft.

Dr. Wanamaker presented a case of a woman, thirty-seven years of age, with carcinoma of the left antrum and ethmoids. There was swelling around and a protrusion of the left eye. The patient had a polyp removed, a turbinate operation, and Caldwell-Luc operation. The wound was then cauterized and radium applied three times. The patient has gained weight and her nose is now clear.

Dr. Morris presented a woman, thirty-seven years of age, with hyperplasia of the left turbinated with cauliflower growth on posterior tip of inferior turbinate.

The paper of the evening, "Plastic Surgery (Facio-Maxillary)," was read by Dr. Harter. It was a very interesting review of the International Clinic of Facio-Maxillary Surgery, which was held in 1925 at the St. Louis Hospital and Anatomical Laboratory of the School of Medicine in Paris.

Dr. Harter presented ten cases of facio-maxillary surgery from his practice. These consisted of projected photographs taken before and after operation and discussion of the problems and difficulties encountered with each. The paper was freely discussed by all members present.

Drs. C. V. Lundvick and F. N. Bjerken were unanimously elected to membership.

There were sixteen members and three visitors present.

SKAGIT COUNTY MEDICAL SOCIETY

Pres., R. W. McKinley; Secty., S. W. Holton

A meeting of Skagit County Medical Society was held in Chamber of Commerce rooms, Mt. Vernon, May 7. There was a large attendance of members. The meeting was followed by a banquet.

Papers were read by Drs. K. Winslow and R. D. Forbes, of Seattle, dealing with important medical and surgical topics.

Dr. J. H. Fits, who has practiced in Montesano for the past twenty-two years, has moved to Los Angeles, where he will practice in the future.

Dr. Paul E. Wiesel, who has practiced for twenty years at Garfield, has located at Montesano for future practice.

PUBLIC HEALTH LEAGUES

OREGON

Clyde C. Foley has been appointed executive secretary of Oregon Public Health League. Mr. Foley has been on the faculty of Reed College during the past year. He is a graduate of Reed College and he also engaged in graduate study at the University of Washington and the University of Chicago.

The executive secretary is formulating policies and plans for expanding the membership of the League. The present organization has about 550 members, all drawn from the medical profession. The intent is to expand the membership among the physicians and also to take in members from other agencies which are interested in questions of public health, such as the Visiting Nurses' Association, the Tuberculosis Association, and the Parent-Teachers Associations.

A committee on Periodic Health Examinations has been appointed. It is made up of Drs. Ralph Fenton, T. Homer Coffen, Ralph Matson, J. G. Fitzgibbon, R. B. Dillehunt, Lawrence Selling, Harold Bean, Frank McCauley, Thomas Joyce, Charles R. McClure, W. K. Livingston, J. Earl Else, and F. D. Stricker. This committee will act as a faculty in presenting a two weeks intensive course in the administration of periodic examinations of aparently well persons. The course will be given in Portland from July 19 to 31, under the auspices of the University of Oregon Extension Division. The fee for the course will be $10.00 for members of the State Society and $20.00 for nonmembers. Plans are also being laid to give a 36 week lecture course during the fall and spring, as well as a correspondence course covering the same period. The idea of the periodic examination has taken firm hold among the physicians of the state and a heavy enrollment for the summer course is anticipated.

Work on the directory of Oregon physicians is well under way. Every effort is being made to make it complete and also to set up machinery whereby it can be kept up to date by annual or biennial revision. The publication of the directory will fill a long felt need.

Dr. C. J. Smith of Portland attended the American Health Congress which met during the week of May 17 to 22 at Atlantic City.

A considerable number of Oregon men attended the annual meeting of the American Medical Association at Dallas, Texas. Dr. Wm. Kuykendall of Eugene and Dr. E. B .McDaniel of Portland attended as delegates of the State Society and Dr. J. A. Pettit of Portland was in attendance as trustee. Dr. T. Homer Coffen presented a paper on "Early Signs and Symptoms of Heart Failure." Drs. J. Earl Else, C. Ulysses Moore, William House, A. A. Witham and R. H. Dillehunt, all of Portland and Dr. H. Dedman of Canby, and Dr. V. L. Hamilton of The Dalles, were also in attendance.

WASHINGTON

ANNUAL LEAGUE CONVENTION

The annual meeting of the Public Health League will be held in Spokane during the convention of the Washington State Medical Association. The session will be in the nature of a luncheon at the Davenport hotel on Tuesday, June 29. In addition to the annual address of President Frederick Epplen, there will be the usual reports of officers and committees. One of the features of the meeting will be the session of the membership committee to be presided over by Dr. C. H. Thompson of Seattle. The work of this committee, appointed by President Nicholson last summer, has resulted in an increased membership in the League.

GOVERNOR HARTLEY RESTORES RUSSELL LICENSE

Public health leaders of the state have been very much disturbed by the action of Governor Hartley in recently restoring the medical license of Dr. Annie K. Russell. Dr. Russell was convicted on a criminal charge in 1915, served some time in jail and was later pardoned. The Medical Board revoked her license on the grounds of moral turpitude. She then appealed to the courts with the plea that the pardon of a governor would automatically restore her medical rights. She lost in all of her court actions. Then she applied under Governor Hart's administration for a new license, which was denied. Later she pressed such a plea before Governor Hartley and the same was granted.

Officials of the Public Health League hold that such action is illegal, especially in view of the fact that the Governor ignored the medical board in the action taken. It is stated that, if the governor really has such an enormous power that he can arbitrarily restore licenses in such a manner, then the medical practice act carries but little protective value to the people of Washington. Plans will be laid for strengthening amendments, if the courts should accept the Hartley action as being legal. It is expected that legal action will be developed in the near future looking forward toward a determination by the courts of this issue, following which the policy of the League in the matter will be decided upon.

WHAT'S IN A NAME

Time was when sanipractic bloomed like a rose. The word was coined by its discoverers in Washington and, therefore, it could be made to mean most anything in the large world of healing. It was something new. It was guaranteed by a medley of healers who had been trying this and that as means of getting by. Schools were hurriedly thrown together in a room here and there. Diplomas were printed. "Doctors" sprang up between the rising and the setting sun. A legislature passed the drugless healers act, with gates left wide open for all kinds, makes and models; and sanipractic rode in with the rising tide.

In the name of sanipractic feuds developed soon. Business managers of different "universities" cast hungry and angry looks at each other. It was a commercial race for pupils and for gold. Indigestion came. And the Public Health League of Washington directed its spotlight of publicity on the scene. The Attorney General acted. One of the "diploma mills" was closed down by court order; another school carried on with difficulty. Then an aroused legislature provided machinery for the revocation of sanipractic licenses—nearly 100 of them.

SANIPRACTIC SLIPPING

Sanipractic has lost its fight in Washington. It has not met with public support, nor do members of the legislature longer listen to its plea. The effort made to get 40,000 signatures on a petition for a referendum on sanipractic, following adverse legislative results at Olympia, is provigin difficult, despite the heavy expenditure of money for this purpose. Many of the former supporters of this cult have deserted. The name of "naturopathy" is being written on the billboard of healing instead of sanipractic.

One of the former professors of the leading school in Seattle is now the operator of a neurologic home and advertises himself as being affiliated with the McCormick Medical College of Chicago. He advises: "Children and old people need tender care. Upon proper food combination depends ease and near painless delivery in obstetrical cases." Sanipractic is not mentioned in this "hospital" prospectus. Another of the cult gives naturopathy as his science. To aid in this campaign to build naturopathy on the ruins of sanipractic, it is stated that Benedict Lust, who is credited with being the discoverer of this cult, will soon be in Washington state prepared to obtain the necessary legislation and to organize schools, such as he has in New York, San Francisco, Portland and other cities.

BOOK REVIEWS

Edited by **KENELM WINSLOW, M.D.**

MODERN MEDICINE. Its Theory and Practice in Original Contributions by American and Foreign Authorities. Edited by Sir William Osler Bart, M.D., F.R.S. Third Edition, thoroughly revised. Re-edited by Thomas McCrae, M.D., Professor of Medicine in the Jefferson Medical College, etc., assisted by Elmer H. Funk, M.D., Assistant in Medicine, Jefferson Medical College. Philadelphia.

Vol. II. Diseases of Doubtful Etiology, Diseases Caused by Protozoa, Spirochetes and Animal Parasites. Diseases Due to Chemical, Physical and Organic Agents. Deficiency Diseases. Cloth, 891 pp. Lea & Febiger, Philadelphia and New York. 1925. $9.00.

Vol. III. Disease of Metabolism. Diseases of the Digestive System. Cloth, 1052 pp. $9.00. 1926.

The excellence of these volumes is proved by the fact that they appear in a third edition after all these years and yet in the meantime Oxford Medicine and two other worthy systems in loose leaf form have come into being and, owing to their perennial nature, would be expected to supplant the older text book on medicine. It is, of course, impossible to notice any but a few of the various monographs in these volumes.

The chapter in Vol. III of nearly 100 pages on diseases of the liver, gallbladder and biliary ducts originally by A. O. J. Kelly, and now revised by B. B. Vincent Lyon, is an admirable summary of our knowledge of these disorders up to the very present moment. The newer classification of jaundice by McNee, the epochal work of Mann of the Mayo Clinic on hepatectomized dogs, showing that bile pigment in the blood, or jaundice, is not chiefly derived from the liver, but is formed also in the bone marrow, and spleen (and probably in the blood vessel walls and lining of the serous cavities) from broken down blood pigment, and the various new liver function tests are all fully discussed. There has been a tremendous advance in our knowledge of liver physiology and function, largely from Mann's work, and in the diagnosis of hepatic and gallbladder disease, owing to the use of the van den Bergh and Rosenthal tests, and the method of x-ray of the gallbladder by tetraiodophenolphthalein, introduced by Graham and Cole. In none of the newer textbooks has the reviewer found such a complete and concise description of this progress as in this article by Lyon.

One curious lapse, however, is to be found under the section on catarrhal jaundice, where Lyon follows the old and mistaken idea that the disease arises primarily as a gastroduodenal catarrh that extends into the common duct, which becomes blocked by swelling and mucus. The modern view is that, while such sporadic cases occur, "the great majority of cases are probably due to hepatic infection," as stated by Rolleston, who happens to write the next chapter in this volume. Lyon naturally advises his "nonsurgical drainage" in a large number of biliary duct and liver diseases, in which other authorities would not concur, but his extensive work along these lines has undoubtedly led him to a most enviable knowledge of these organs.

The second volume is filled with a rather miscellaneous collection of diseases. In this Strong writes a splendid article on amebic dysentery and the latest treatment with stovasol, etc. Another admirable chapter is that originally written by Osler and Churchman and now revised by Lewis Connor. It is a difficult matter to present such an enormous subject in 72 pages and only the genius of Osler could have presented it thus in such a masterly manner. The success of these volumes is due to the good judgment of Osler in the selection of the various authors. In the first volume we pointed out a striking instance in which the chapter on poliomyelitis had not been brought up to date, but in these two volumes the revision is wholly satisfactory and the work is highly commended.

WINSLOW.

EARS AND THE MAN. Studies In Social Work For the Deafened. By Annette W. Peck, Estelle E. Samuelson, and Anne Lehman. With an Introduction by Wendell C. Phillips, M. D., President-Elect of the American Medical Association. Cloth, 217 pp., $2.00. F. A. Davis Co., Philadelphia, 1926.

The value of this little book demands more extended comment than its size would seem to indicate. The plight of the blind and the crippled is so evident that it is easily appreciated but the problems which the deaf have to solve are not always given their proper consideration. Many of these unfortunates are seriously handicapped in the business of life, even to the point where suicide has seemed the only way out. The otologist should not feel that his duty has been discharged when he has pronounced his verdict on the incurably deaf patient. In many cases this only confirms the patient in his social attitude and does not curb his frantic pursuit of quack cures, with the result that valuable time and money are wasted on the charlatan, when they might have been profitably spent in rehabilitating the patient for his proper place in society.

The mental attitude of many of these patients makes them difficult to handle and they need moral support until they are able to adjust themselves to their changed status. There are many ways in which this may be accomplished and it is the duty of the otologist and the family physician, as well, to become acquainted with the work being done along this line by the social workers in this field. In this volume there is a discussion of the patient from the standpoint of different personalities and the ways of handling them; chapters on lip reading, mechanical hearing aids and social and economic rehabilitation with case reports.

The final chapter contains a plea for prevention of deafness in childhood and for more research work in the cause, prevention and cure of deafness. Every physician owes it to his patients to read this book and should advise his deaf patients to read it. It can be easily understood by the layman and carries a message of encouragement as well as an exposure of the charlatans who prey upon the unfortunate deaf. F. A. Brugman.

Chemical Pathology. Being a Discussion of General Pathology from the Standpoint of the Chemical Processes Involved. By H. Gideon Wells, Ph. D., M. D., Professor of Pathology in the University of Chicago, and in the Rush Medical College, Chicago. Fifth Edition, Revised and Reset. Octavo of 790 pages. Philadelphia and London: W. B. Saunders Company, 1925. Cloth, $8.50 net.

The value of biologic chemistry in its relation to medicine is daily gaining further recognition and it is certain that many of the problems now besetting medical science will find their explanation in some phenomena of colloid or electro chemistry, at present unknown or only vaguely understood. Without first giving thought to the problem confronting the author of this volume one would be apt to express dissatisfaction with the rather bewildering array of contradictory facts and theories which are quoted in discussing a single subject, which leaves the reader totally at a loss to know which is the outstanding and most generally accepted one. It must be remembered, however, that this is a comparatively new science, in which little has been actually proven, and the author states that, while he realizes the work could be much condensed, he wishes it to serve as a volume for reference and as a stimulus to further investigation.

This work is highly specialized and complete, and while there is much of value to the average physician, it requires much reading, sifting and selection to be obtained. Chapters dealing with the Wassermann reaction, in which the more modern conceptions of the mechanism are considered; the causes and effects of anaphylaxis and allergy; the various forms of anemia and their underlying causes and chemistry; the formation, composition and chemistry of urinary and biliary calculi; the known chemistry and speculative probabilities of neoplastic processes, and the physiologic chemistry of the ductless glands cover outstanding subjects in a very complete manner and are especially recommended for reading by members of the profession. Cefalu.

A Textbook of Physiology. For Medical Students and Physicians. By William H. Howell, Ph. D., M. D. Ninth Edition, thoroughly Revised. Octavo of 1069 pages, 308 illustrations. Philadelphia and London: W. B. Saunders Company. Cloth $6.50.

This volume, now in its ninth edition, needs no introduction to the medical profession. It gives a very readable account of physiologic phenomena which is most welcome to the student, who is often bewildered by the more encyclopedic type of text or the special monograph. The book is written primarily from the descriptive point of view, and tends to avoid controversial points in the interpretation of observed phenomena and "the danger that error rather than truth may result from the premature use of exact methods in the handling of confessedly incomplete data."

An Intermediate Textbook of Physiological Chemistry, with Experiments. By C. J. V. Pettibone, Ph.D., Associate Professor of Physiological Chemistry, Medical School, University of Minnesota, Minneapolis. Third Edition. 404 pp. $3.25. The C. V. Mosby Company, St. Louis, 1925.

The first 245 pages present an outline of physiologic chemistry in a clear manner. The remainder of the book gives the laboratory methods used by the author with his classes. The work is intended for medical students, but is an excellent work for the practitioner who wishes to bring his knowledge of physiologic chemistry up to date. There are chapters on carbohydrates, fats and proteins. "Some Familiar Foodstuffs" are treated in another short chapter. Four chapters are devoted to digestion and absorption. Then follow chapters on the urine and metabolism. The book is remarkable for its conciseness and clearness. Griswold.

Essentials of Prescription Writing. By Cary Eggleston, M. D. Third Edition, Revised, 146 pages. Philadelphia and London: W. B. Saunders Company. Cloth, $1.50 net.

This small volume is intended to provide the student of medicine with a succinct, yet sufficient, treatment of the subject of prescription writing. It is designed to carry him through the subject in a sequential manner and to prepare him to construct a grammatic and proper prescription to fill any need. This third edition is concise and covers the essen-

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tials exceedingly well. The chapters on Latin grammar, practical writing of prescriptions, vehicles and incompatibility are well worth reading. To those who wish to improve themselves in this art this little book will answer admirably.

Nonsurgical Treatment of Diseases of the Mouth, Throat, Nose, Ear and Eye. By Thos. H. Odeneal, M. D. Otologist, Rhinologist, Laryngologist and Ophthalmologist to Beverly Hospital Corporation, Beverly, Mass., etc. Cloth, 428 pp. $4.00. P. Blakiston's Son and Co. Philadelphia, 1926.

This is a sketchy collection of notes and observations on the treatment of diseases of the eye, ear, nose and throat. While nonsurgical treatment is stressed, operative treatment is freely advised as being necessary in many cases. The various diseased conditions are taken up in order and a short space devoted to each; so short in many cases as to be of little help. Some of the author's observations are original and interesting, others are not. As a textbook it does not cover anything that is not contained in any textbook on eye, ear, nose and throat, and is too condensed to rank as a reference work. Part Two. which makes up one-fourth of the volume, is better. It is devoted to a discussion of serums and vaccines, theories concerning the vegetative nervous system, focal infection and other features which are not usually treated in one work. F. A. Brugman.

Modern Methods of Amputation. By Thomas G. Orr, A.B., M.D., F.A.C.S. Professor of Surgery, University of Kansas. One hundred twenty-five illustrations. 117 pp. $3.50. The C. V. Mosby Co., St. Louis, 1926.

Much has been written on the subject of amputations and before the antiseptic era this comprised the bulk of the work of the surgeon. Apart from the methods introduced into surgery by Lord Lister, the surgery of amputations has been little changed and the operations of Syme, Lisfranc, Gritti-Stokes and others are still models and have not been improved upon. All the classical amputations are clearly described in this book and possibly the only criticism one can make is the omission of the excellent amputation at the knee joint which bears the name of Dr. Stephen Smith, a well known surgeon in his day in New York. The reveiwer believes there is no better operation for use in cases of senile gangrene. A chapter is devoted to the subject of artificial limbs and describes cinematiplastic amputations. The book is clearly and profusely illustrated. Forbes.

A Manual of Hygiene and Sanitation. By Seneca Egbert, A. M., M. D., Dr. P. H. Professor of Hygiene, University of Pennsylvania, etc. Eighth Edition, Enlarged and Thoroughly Revised. Illustrated with 154 engravings and 4 plates. 116 pp. $4.00. Lea & Febiger, Philadelphia and New York, 1926.

The many advances in hygiene and sanitation in recent years have produced numerous changes in the latest edition of this work. It has been thoroughly revised to meet existing knowledge on these important subjects. After a comprehensive introduction, the subject of bacteriology and parasitology are considered, followed by a new chapter on transmission of disease, which explains modes of infection and their relative importance. The chapter on immunity is in sequence and presents concisely this important subject. Under the heading personal hygiene are discussed matters ranging from heredity to baths and clothing. Many important items are presented for consideration. The universal adoption of touring has led to a chapter on touring and vacation hygiene, a matter which demands attention on the part of all of our states at the present time. This volume presents much valuable information for one interested in this important subject.

The Surgical Clinics of North America. (Issued serially, one number every other month.) Volume VI, Number II (San Francisco Number—April, 1926). 250 pages with 73 illustrations. Per Clinic year (February, 1926, to December, 1926). Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

This San Francisco number presents many clinical reports on a variety of subjects. Eloesser offers an interesting description of intrapleural pneumolysis. After giving the indications he describes the technic of the operation. Clinical reports are presented of four cases, well illustrated by roentgenograms. Maxwell discusses inversion of the uterus, including etiology, symptomatology and treatment, as well as manipulative and operative procedures. This is an instructive consideration of this rather rare condition. Bartlett and Callander present an extensive exposition of neck dissections, well illustrated to demonstrate anatomic relations. A perusal of this discussion will be a helpful preliminary to surgeons in this locality. There is a good number of other worthwhile clinical demonstrations.

The Medical Clinics of North America. (Issued serially, one number every other month.) Volume IX, No. 5 (Chicago Number, March, 1926). Octavo of 206 pages with 34 illustrations. Per Clinic year, July, 1925, to May, 1926. Paper, $12.00; Cloth, $16.00 net. Volume IX, No. 6 (Chicago Number, May, 1926). Octavo of 202 pages including complete Index to Volume IX, with 24 illustrations.

These two Chicago volumes present clinics on many interesting topics. Diabetes mellitus associated with pulmonary tuberculosis is discussed by Elliott and Nadler, illustrated by four cases. Formerly this combination was considered fatal, owing to conflicting indications in the treatment of the two conditions. The use of insulin has made it possible to treat the combination as is illustrated in the text. Strouse and Daly discuss diabetes and pregnancy, illustrated by four cases. These cases are true diabetics, carried through by strict attention to detail. Pilot illustrations by three cases fusospirochetal pulmonary infection complicating diabetes mellitus. The sources of infection in these cases are the bacteria found in teeth, tonsils and nasal pharynx. Other writers discuss various phases of heart disease and diseases of the blood. Several clinic reports illustrate gastrointestinal disturbances. These volumes are full of valuable instruction, as is always the case.

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The Journal of the State Medical Associations of Oregon, Washington, Idaho, Montana and Pacific Northwest Medical Association

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ORIGINAL CONTRIBUTIONS

LIVER FUNCTION TESTS AND THEIR CLINICAL VALUE

KENELM WINSLOW, M.D.
AND
W. E. GIBB, B.S.

SEATTLE, WASH.

From King County and Virginia Mason Hospitals

From a practical point of view, liver function tests interest the medical man so far as they aid in diagnosis, prognosis and treatment. The difficulty we have in differentiating between inflammatory and malignant disease of the liver, gallbladder and bile ducts is well known. Chills, high fever, liver tenderness and jaundice often lead us to diagnose inflammatory disease, when operation reveals cancer. A painless, persistent jaundice in an elderly person, with great emaciation and no gallstone history, may cause us to suspect carcinoma, when surgery discovers a stone in the common duct.

It may be equally difficult to distinguish between a catarrhal or infectious jaundice and an obstructive one curable by surgery. And there are the obscure hepatic diseases without icterus or any characteristic signs or symptoms of liver lesions, as occasionally happens in portal cirrhosis, syphilis and cancer of the liver. During the past year, with the limited number of cases available in the King County and Virginia Mason hospitals, and with the aid of some of the more important literature[1] on liver function tests, we have tried to evaluate them so far as possible, more particularly in reference to diagnosis.

Since 1909, when Abel and Rowntree showed that phenoltetrachlorphthalein injected under the skin was eliminated wholly by the bile, the injection of such dyes into the blood stream has been employed by many investigators to determine quantitatively the function of an organ by measuring either the retention or elimination of the dye. Later, after the renal function test of Rowntree with the dye phenolsulphonephthalein received universal acceptance, and the various methods of blood chemistry for determining renal function came into use, there followed further attempts to measure liver function.

But here the problem becomes more difficult and complicated, for, where the kidney has primarily one function — elimination — the liver has many functions. Then, again, the liver functions must be measured indirectly through the blood stream. And, lastly, though eighty per cent of the liver tissue be destroyed, the remaining twenty per cent of healthy tissue may carry on normal function (Mann).

The chief liver functions are as follows:

1. Storage of glycogen in the liver for liberation as glucose in the blood. This power is also shared by the muscles and other tissues but, with removal of the liver, the animal loses completely the ability

to regulate blood sugar level. With extirpation of the pancreas alone the liver cells lose entirely their power to store glycogen.

2. The production of urea in the liver from amino acids and ammonia and the destruction of uric acid by the liver.

3. The secretion and excretion of bile by the liver, excretion being much more important as a liver function.

4. Probable detoxicating action on split proteids.

5. Probable fibrinogen formation in the liver aiding blood coagulation.

6. Possible function of the liver to desaturate and so directly oxidize fats.

Before presenting the results of our own tests with a few of the methods for determining liver function, a review will be given of some of the methods that have been devised and in a measure accepted. These methods will be discussed along with the particular function which they are designed to measure.

CARBOHYDRATE METABOLISM

The one and only method in use today that endeavors to measure the relation of the liver to carbohydrate metabolism is the levulose or fructose tolerance test, as modified by McLean and de Wesselow. The patient is fasted for fourteen hours and no food is taken during the test. Following a normal blood sugar estimation the patient is given 40 grams of fructose, dissolved in 200 c.c. of lemonade. Blood sugar estimations are then made at one-half hour, one hour, two hours and three hours. A positive test is considered when the maximum rise is over 30 mg. Mann, in his work on dehepatized dogs, has established the fact that the liver seems to be the main, if not the only organ, capable of forming glycogen from fructose and galactose.

All reports on this test up to the present time indicate that, due to the difficulty of excluding extrahepatic diseases, as pancreatitis, and because findings in hepatic diseases are not constant or uniform, it will be of little clinical assistance in the milder forms of hepatic disease where it is most desired. In advanced stages of metastatic carcinoma and cirrhosis of the liver, marked deviations from the normal are found.

PROTEIN METABOLISM

Following his experimental work on dehepatized dogs, Mann drew these conclusions: (1) Urea production ceases immediately. (2) Uric acid is not destroyed and actually accumulates in the blood or tissues, and is excreted in the urine. (3) The liver plays no part in the creatine-creatinine metabolism.

After the production of obstructive jaundice by ligation of the common duct in animals, there is very marked decrease in blood urea. Rowntree, Marshall and Chesney found that, while blood urea was slightly decreased in hepatic disease in man, yet this is not sufficient to be of diagnostic value.

After operation for relief of obstructive jaundice, toxemia may ensue, with increase of blood urea and jaundice. This condition may be overcome by intravenous glucose injection. Greene has pointed out in this connection that impairment of one liver function, as bile excretion, is not necessarily associated with impairment of other liver functions, as urea formation. In this lies the necessity for various liver function tests. Blood urea and creatinine estimations were performed in nearly all of this series of patients and no deviations from normal were noted.

BILE PIGMENT

Normal human serum owes its color to contained bilirubin, amounting to from 0.2 to 1.5 mg. per 100 c.c. of serum. Bile is composed of bilirubin and bile salts. Bilirubin or bile pigment is derived from blood pigment or hemoglobin in broken down, effete red blood corpuscles. Bile pigment is not chiefly formed in the liver,* as hitherto taught, but mostly in the bone marrow, less in the spleen, and least in the liver (Bollman, Mann and Sheard.) The excretion of bilirubin by the liver is much more important than its formation in this organ. Bile salts, on the other hand, are solely secretory products of the liver.

Jaundice is retention of bilirubin in the blood or bilirubinemia. Three forms are recognized:[2]

1. Gross obstructive jaundice. This is due to blocking of the outflow of bile in the large ducts, as by stone in the common duct, extrinsic tumor, swelling from inflammation or tumor of the head of the pancreas. Here damming back of the bile causes the finer ducts to rupture into the lymph spaces of the liver and from thence the bile passes into the blood through the thoracic duct.

2. Toxic and infectious hepatic jaundice. There are two causative factors: (a) Damage of the polygonal liver cells lining the bile capillaries so that normally formed bilirubin is unable to enter or pass through them. (b) Obstruction in the finer bile ducts from inflammatory exudate and thrombi of inspissated bile, resulting from cholangitis in so-called catarrhal or infectious jaundice. Hepatic jaundice is caused by poisoning by chloroform, arsphenamine, and occurs in cirrhosis of the liver, he-

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* The late Sir Lauder Brunton was fond of recalling the answer of a medical student to the question: "Where is bile formed and what are its uses?" The reply was equally concise, if not correct. "Bile is formed in the stomach and used to clean carpets with."

patitis and infections, acute yellow atrophy of the liver, pneumonia, exophthalmic goiter, and in passive congestion of the liver from myocardial weakness.

3. Hemolytic jaundice. In this hemolysis sets free too much bilirubin to pass through normal liver cells and retention in the blood or jaundice results. This is seen in hemolytic icterus, worm anemias and pernicious anemia.

In toxic, infectious jaundice it is probable that all three factors are responsible for the icterus in some cases, i.e., damage to the liver cells, obstruction of the finer bile ducts from cholangitis and hemolysis. The color of the blood serum is fairly constant, unless increased by jaundice or by pigments, as carrotin and xanthophyll.

A large number of tests have been devised to measure the amount of bilirubin in the blood serum. These fall into three groups.

1. By oxydizing bilirubin into biliverdin by addition of concentrated nitric acid to the serum. The Gmelin and Fouchet tests are examples of this group. They are rarely positive unless there is some discoloration of the tissues,[3] and the Fouchet test has proved positive in patients without jaundice but with other diseases.

2. The second type of test was introduced by Meulengracht in 1921 and was afterward adopted by Bernheim, Bernhard, De Witt Stetten and others. This test assumes that bilirubin is the chief pigment in blood serum. The serum is matched in a colorimeter with a 1 to 10,000 dilution of potassium dichromate as a standard.

The standard is set at 15 and the quotient obtained by dividing the reading of the serum into 15, which gives a number supposed to represent the amount of serum bilirubin present. This is called the icterus index.[3] The icterus index of normal serum lies between 2 and 5, the zone of latent icterus between 6 and 16. If clinical jaundice is absent, the icterus index should be below 15.

We have found the following conclusions as stated by Bernheim,[4] Barrow,[6] Shattuck,[7] and others to be entirely correct:

DISADVANTAGES

1. The standard deteriorates and becomes lighter.
2. Serum must be clear, not hemolyzed or cloudy.
3. Substances other than bilirubin give color to serum, such as carrotin and xanthophyll.
4. Blood must be taken in the fasting state.

ADVANTAGES

1. Helps to differentiate hemolytic from nonhemolytic jaundice.
2. Shows that the anemia of gastric cancer is nonhemolytic.
3. Normal index in gastric ulcer, high index in duodenal ulcer.
4. Shows progression or retrogression of jaundice.
5. The test is simple, accurate, quantitative, and of definite clinical value, provided certain precautions are taken in collecting the blood.
6. No danger or inconvenience to the patient.

In the 1926 edition of Osler's Modern Medicine, Lyon states that an icterus index between 6 and 20 is found "in cholangitis, cholelithiasis, cholecystitis, adhesions to the gallbladder or liver disease involving the bile ducts, hepatitis, cirrhosis and cancer of the liver. Also in hemolytic jaundice, hematomas, a ruptured viscus with blood extravasation, in cardiac decompensation, pneumonia, malaria and typhoid fever." This is no more than saying *if* bilirubin retention exists in these diseases, but many of them may be present without bilirubinemia. Lyon concludes with, "It is probable that icterus index is the most useful single functional test for general clinical work." It seems to us that the van den Bergh test is of more value.

The third type of test was first devised by van den Bergh and Schnappen[5] in 1913 and since has undergone little revision. Ehrlich's old diazo reaction is the basis for this method. When an acid solution of diazonium salt is added to an alcoholic solution of bilirubin, there develops an azo dye, azobilirubin. This test is positive for pure bilirubin in a dilution of 0.6 mg. per liter and is not positive for biliverdin or other substances that give color to serum.

Van den Bergh[5] found in his experiments with bilirubin and solutions of human bile that a positive diazo reaction was obtained with solutions of human bile without the addition of alcohol. This latter he called the "direct reaction," and, when alcohol was used to produce the coloration, he styled it the "indirect reaction." Van den Bergh conceives that the bilirubin in normal serum or in serum in hemolytic jaundice differs from that in serum of obstructive or hepatic jaundice where bilirubin undergoes some change in the liver cells and resembles bilirubin found in bile. Hence the direct immediate reaction in obstructive or hepatic jaundice, and the indirect reaction in hemolytic jaundice. The finer points relating to the interpretation of the negative, delayed and biphasic reactions are still *subjudice.*

VAN DEN BERGH TEST:
DIRECT AND INDIRECT REACTION

The qualitative or direct reaction, and the quantitative or indirect reaction are described and fully discussed by Radvin.[8] The technic of these tests is as follows:

First, direct reaction. Ehrlich's diazo reagents No. 1 and 2 are used in this test. These reagents must be made fresh once a month. To 25 c.c. of solution No. 1 is added 0.75 c.c. solution of No. 2 just before using. To 1 c.c. of serum is added 1 c.c. of this reagent. Note the time of appearance of maximum color. The reaction reads as follows: First, immediate, if violet color appears in 30 seconds; second, delayed, if color appears after 30 seconds and up to an hour; third, biphasic * if color appears before 30 seconds and reaches a maximum after 30 seconds.

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* Diphasic should be used in preference to the invariably employed "biphasic," which is of Latin-Greek hybrid origin, and not in the dictionary.

The immediate or direct reaction is supposed to indicate obstructive jaundice. The delayed reaction is reported to be seen in latent or in hemolytic icterus. The biphasic reaction is said to mean that there are two kinds of bilirubin in serum, one giving a direct or immediate reaction only, and the other only a delayed reaction; one resulting from damaged liver cells, and the other from obstructive cholangitis which occurs in toxic and infectious hepatic jaundice.

Second, indirect reaction. One c.c. of serum is added to 2 c.c. of 95 per cent ethyl alcohol. The specimen is centrifuged and, to 1 c.c. of the clear supernatant fluid is added 0.25 c.c. Ehrlich's diazo reagent and 0.5 c.c. of 95 per cent ethyl alcohol. Normal serums give a faint pink color. Pathologic, jaundiced serums yield a deep violet hue.

The color produced in the serum is matched in a colorimeter against a standard as prepared by van den Bergh and described in his original article. The directions for making up these standards may be found in the *American Journal of Medical Sciences* for June, 1925. The reagents must be fresh and of good quality.[8]

The estimation of serum bilirubin is of vast clinical importance in being an exact method instead of a dubious one, and in enabling one to detect slight degrees of jaundice heretofore impossible. Whether the icterus index of Meulengracht, or the indirect quantitative test of van den Bergh will be our choice, depends largely on laboratory facilities.

The indirect van den Bergh reaction undoubtedly gives a more exact chemical estimation of milligrams of bilirubin per 100 c.c. of blood serum than does the icterus index test. It does not inconvenience the patient and gives no false readings. However, the van den Bergh test requires more time and can only be done by an experienced technician.

DETOXIFYING ACTION OF THE LIVER

In 1920 Widal suggested that one function of the liver is the detoxification of protein split products, such as proteoses and peptones. Failure of the liver to detoxify these products permits them to gain entrance into the general circulation. The anaphylactic reaction produced causes a transitory leukopenia, which Widal called the hemoclastic crisis.

To measure this function of the liver the patient is given 200 c.c. of milk and the white blood count is repeated at half hour intervals. Numerous workers have failed to confirm Widal's results, and the value of this functional liver test in the diagnosis of hepatic diseases is extremely questionable.

EXCRETORY FUNCTION OF THE LIVER

Since Rowntree, Hurwitz, and Bloomfield first introduced phenoltetrachlorphthalein into clinical medicine in 1913, many investigators have tried by various methods to demonstrate its value as a test of liver function. The test was based on the fact that this dye, given intravenously, was wholly excreted by the normal liver. It was collected from the feces, with the use of cathartics in the earlier experiments, but this being too complicated and unpleasant, instead of attempting to measure the amount of dye excreted, Rosenthal in 1922 conceived that the estimation of the dye retention in the blood would accomplish the same result. In other words, he arrived at the same end by measuring the amount of dye retained in the blood, as Rowntree did by estimating the quantity eliminated by the liver.

Rosenthal collected the blood at fifteen minute, one hour and two hour intervals after the intravenous injection of a solution of phenoltetrachlorphthalein containing 5 mg. per kilo of body weight. The clear serum is separated and 1 drop of 10 per cent NaOH solution is added and comparison is then made with standard tubes. In a normal person 5 to 7 per cent of the dye remains in the serum at fifteen minutes, and only traces at the end of one hour. Especially in cases of cirrhosis and metastatic cancer of the liver and obstructive jaundice is marked retention of the dye in the serum reported.

In April, 1925, Rosenthal and White[9] described their findings with a new dye, bromsulphalein* or phenoltetrabromphthalein. This dye is closely related to phenoltetrachlorphthalein in its physiologic actions. Rosenthal reported a retention of the dye in 20 cases of liver disease, varying at the end of thirty minutes from 3 to 99 per cent.

In using phenoltetrachlorphthalein these authors report that certain disadvantages have been encountered. (1) The amount of dye is rather large—5 mg. per kilo body weight. (2) The concentration never reads over 35 per cent. (3) Irritation of veins and systemic reaction occurred in over 25 per cent of the patients upon whom it was used.

The use of bromsulphalein has given these advantages over the old method of using phenoltetrachlorphthalein: (1) Only 2 mg. per kilo of body weight is used. (2) In normal cases the dye is completely eliminated at the end of thirty minutes. (3) Concentration reaches as high as 90 per cent at the end of thirty minutes, in advanced states of hepatic disease. (4) No irritation of the vein, thrombosis or systemic reaction has occurred.

The technic is as follows:

Two mg. of bromsulphalein per kilogram of body weight are given in a 5 per cent solution. If the weight of the patient is divided by 55, the result will be the exact amount in c.c. of the 5 per cent solution required. This amount is given intravenously and great care should be exercised so that none of the solution will get into the surrounding tissues. Five c.c. of blood is withdrawn from the opposite arm at the end of five minutes, and again at the end of thirty minutes. It is best to obtain a specimen of blood before giving the dye, so as to obtain the normal serum. These specimens are placed in the ice box, and the serum is allowed to separate so that no hemolysis occurs. The serum is cleared of red blood cells by centrifuging. To the clear serums two drops of a 10 per cent solution of NaOH is added in order to bring out the color of the dye. These serums are then compared in a colorimeter against known percentage solutions of the dye prepared according to the technic of Rosenthal. The normal clear serum is always placed in front of the standard tube when making the comparison. The standard with which the serum matches represents the percentage of dye present in the serum. In normal serums there should be no dye remaining at the end of thirty minutes.

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* Bromsulphalein is prepared by Hynson, Wescott and Dunning in ampoules containing a sterile 5 per cent solution.

Previous to April, 1925, we had taken very little interest in any of the methods for testing liver function. The icterus index test had been tried on a few serums with rather unsatisfactory results. This was mainly due to unnatural colors in the blood serums and hemolysis. The phenoltetrachlorphthalein was not commonly used, as most writers were rather doubtful as to its practicability.

Following the appearance of Rosenthal's article[9] on bromsulphalein, and Elizabeth Radvin's paper[8] on the clinical value of the van den Bergh test in 1925, we undertook to study these two tests as applied to patients suspected of having impaired liver function. The series is not large and does not represent all admitted to the King County or Virginia Mason hospitals with diseases involving jaundice or impaired liver function. We endeavored to select those patients in whom the diagnosis could be confirmed by operation or autopsy.

CLINICAL VALUE OF LIVER FUNCTION TESTS

In most part the results reported under this head are those to be found in the literature of the subject. In how far our own findings differ from these may be seen later. We believe that the van den Bergh and dye retention tests are the most valuable, especially the former as a quantitative measure of bilirubin in the blood. Both are excretory tests, the bromsulphalein because it is only excreted by the liver in bile. The van den Bergh is either a direct or indirect excretory test; direct when liver excretion is directly at fault, and indirect when normal excretion of the liver can not eliminate an abnormal amount of bilirubin from the blood.

In obstructive jaundice serum bilirubin is said to run as high as 40 to 50 mg. per 100 c.c. of serum. The direct reaction, it is affirmed, is always found in this type of jaundice. The direct reaction almost invariably occurs in toxic, infectious or catarrhal hepatic icterus as well, although it may be delayed.

When there is a direct van den Bergh reaction, there is always an indirect reaction, but the converse is not true. Following ligation of the common duct in animals, the van den Bergh reaction is first indirect, then biphasic and then direct (Mann).

Only the indirect reaction is commonly obtained in hemolytic jaundice, so the presence of increased bilirubin content by the indirect reaction will discriminate between hemolytic and obstructive or hepatic jaundice, but not between obstructive and hepatic icterus. The indirect van den Bergh reaction is chiefly of value in measuring the precise amount of bilirubin in the blood and to detect small degrees of bilirubinemia, or what is called "latent jaundice," not discoverable by clinical means.

In suspected biliary colic it may confirm the diagnosis, and detect the beginning of toxic jaundice following injections of salvarsan. Latent jaundice may be found in pernicious anemia, and in tapeworm anemia (Greene). The progression or retrogression of jaundice may be accurately estimated, and so surgery be instituted at the most favorable date, and prognosis be placed on a surer footing. Whether to employ salvarsan in treating syphilis, or in pernicious anemia with gallbladder involvement, may be solved by the indirect van den Bergh test.

A high bilirubin content will indicate the probable onset of toxic hepatic jaundice in pneumonia, exophthalmic goiter, toxemia of pregnancy, and after administration of chloroform and arsphenamine, and may prove an early sign of passive congestion of the liver in a failing heart (Greene).

After removal of the liver from a dog the serum gives first indirect, then biphasic and then delayed reaction which does not occur in hemolytic jaundice (Mann). "The exact significance of the direct and indirect reactions is not entirely clear and the value of the direct reaction in differential diagnosis is doubtful." (Greene et al.)

Dye retention does not occur after ligation of the common duct in dogs until two or three days, at the same time that bile pigment begins to appear in the blood, with maximal dye retention during the second to fourth weeks, when it may reach 40 to 60 per cent, according to Schnell. The serum bilirubin retention, as shown by the indirect van den Bergh reaction, increases hand in hand with the dye retention in the blood in obstructive jaundice.

So also in other varieties of icterus, as in infectious or catarrhal jaundice, in toxic jaundice from the effect of salvarsan or chlorofrom, in toxic jaundice of pneumonia, exophthalmic goiter and acute yellow atrophy of the liver, the dye retention parallels the increase in serum bilirubin (Greene).

Cases of acute or chronic cholecystitis without

No.	Hosp.	Dye Retention, % Bromsulphalein		Van den Bergh Reaction		Diagnosis
		5 Min.	30 Min.	Direct	Indirect	
1	County	95	70	0	0.4 mg	Atrophic portal cirrhosis. No jaundice. Autopsy.
2	County	10	0	0	0.5	Atrophic portal cirrhosis. No jaundice. Autopsy.
3	County	65	25	0	0.4	Atrophic portal cirrhosis. No jaundice. Autopsy.
4	County	95	30	0	0.4	Atrophic portal cirrhosis. No jaundice. Autopsy.
5	County	35	5	0	0.6	Atrophic portal cirrhosis. Talma operation. No jaundice.
6	County	15	0	Immed.	8.0	Atrophic portal cirrhosis. Marked jaundice. Autopsy.
7	V. M.	....	Icterus Index 15	Delayed	2.15	Biliary cirrhosis. Boy.
8	County	15	0	0	0.0	Metastatic cancer of liver secondary to primary growth in pancreas. Autopsy. No jaundice.
9	County	60	0	0	1.65	Metastatic carcinoma of liver. Primary growth in colon. Exploration.
10	V. M.	75	23	Immed.	20.0	Cancer of gallbladder. Obstruction by pressure on common duct. Operation. Marked jaundice.
11	County	3.5	0	Immed.	15.0	Probable metastatic peritoneal carcinomatosis following primary cancer of breast. Jaundice and ascites. No autopsy.
12	County	20	0	0	0.4	Chronic cholecystitis. No jaundice. Cholecystectomy.
13	County	15	0	0	0.8	Chronic cholecystitis and appendicitis. No jaundice. Cholecystectomy and appendectomy.
14	V. M.	20	0	0	0.9	Chronic cholecystitis.
15	V. M.	30 35 35	0 10 8	0 0 0	0.6 0.6 0.4	Stricture of common duct following gallbladder operation. Dye retention on obstruction of drainage tube.
16	V. M.	15	0	0	0.3	Chronic cholecystitis. Large liver. No jaundice.
17	V. M.	35	0	0	0.8	Large liver. No jaundice. Chronic cholecystitis.
18	County	60	0	Icterus Index 12	1.65	Chronic cholecystitis. Cholelithiasis. No jaundice. Cholecystectomy.
19	County	50	25	Icterus Index 2	0.2	Chronic cholecystitis. Cholelithiasis. Slight icterus. Cholecystectomy.
20	County			Delayed Icterus Index 15	5.5	Pernicious anemia.
21	County	10	0	Icterus Index 10	0.4	Pernicious anemia.
22	County	Unsatisfactory		Icterus Index 6	0.4	Pernicious anemia.
23	County	2	0	Immed.	5.0	Jaundice following arsephenamine injection in syphillis.
24	County	95	10	0	0.6	Dilation and hypertrophy of heart. Hypertension, enormous liver and ascites. No jaundice. Ascites disappeared and liver greatly reduced in size.
25	County	40	15	Diphasic Icterus Index 30	3.3	Toxic jaundice in lobar pneumonia.
26	County	40	0	0	2.1	Far advanced metastatic carcinoma of liver. Primary in colon. No jaundice.

jaundice do not show dye retention to any extent but, with the development of jaundice, dye retention is found and increases with the amount of obstruction from stone, cholangitis, and perhaps resulting hepatitis. When jaundice disappears, due to surgery or nature, some dye retention may persist from damage done the liver cells (hepatitis).

It is well to emphasize at this place that bilirubin retention in the blood *per se* leads to marked disturbance of liver function, in time to cirrhosis. As often happens in medicine, a vicious circle is thus established. For example, retention of bile in the blood results from obstruction of the common duct by stone. This bilirubinemia in itself disturbs liver function and so the liver disorder becomes progressive.

But it is in the cases of hepatic disease without jaundice that the dye retention test is said to display its greatest diagnostic value, as in atrophic portal cirrhosis, syphilis and carcinoma of the liver.

The findings in the limited number of cases at our disposal do not, however, altogether bear out those reported by the authorities quoted. These tests are quite new and only when they have been subjected to numberless trials by a great many observers, and over a considerable period of time, can a just evaluation be made.

In the table of cases submitted there are three of metastatic carcinoma of the liver, secondary to primary growth in the pancreas and colon. These were very extensive malignancies, involving practically the whole liver, and yet in none was there any dye retention at thirty minutes. As has been noted by many observers, the presence of retention depends upon the extent of involvement of the hepatic tissue, because the liver possesses great functional reserve and 20 per cent of normal gland is capable of functioning efficiently. But, on the other hand, dye retention has been held forth as a very early sign of metastatic carcinoma of the liver, and as enabling one, in its absence, to remove a primary cancer in other abdominal organs (as the colon) with a considerable degree of assurance.

Our results in these three cases are very unsettling because of the extensive involvement of the liver and the entire absence of dye retention at the end of thirty minutes with the bromsulphalein test. In cases of obstructive jaundice with cancer (case 10), the dye retention is as marked as in all patients with other forms of obstructive icterus. In eighteen cases of metastatic cancer of the liver, reported by Greene et al,[1] there were seven instances in which the dye retention test was negative. So that too much reliance must not be placed upon a negative finding in the dye retention test in suspected metastatic cancer of the liver without jaundice.

On the other hand, our results in portal cirrhosis of the liver have been more like those reported, but far from satisfying. In four cases of portal cirrhosis the dye retention at thirty minutes was respectively 5, 25, 30, and 70 per cent. It is true, however, that these were all in a very advanced stage of the disease and the patients approaching death. But here, again, in two of our cases of portal cirrhosis, one with marked jaundice, the bromsulphalein test was negative and there was no dye retention at the end of thirty minutes. Neither was there any question as to diagnosis, since both subjects came to necropsy and microscopy.

While a negative bromsulphalein test may prove misleading, as has been pointed out, a positive finding may be of the greatest import in unsuspected hepatic disease, or in corroborating a diagnosis already made. And so also a bilirubinemia, discovered by the indirect van den Bergh reaction or icterus index test, reveals a latent jaundice that would otherwise be missed.

The dye retention test has been reported normal in some cases of well marked portal and biliary cirrhosis,[10] so that too much confidence must not be placed in negative findings with bromsulphalein as excluding cirrhosis. Rosenthal believes that positive findings in atrophic portal cirrhosis are more likely to be obtained than in gummatous scars of hepatic syphilis, because in portal cirrhosis the scar tissue is more diffuse and in syphilis more scattered. Also, that the scar tissue in cirrhosis occurs early and is so diffuse that the liver is held in a vise-like framework of connective tissue and is unable to hypertrophy and so continue to function efficiently.

In cholecystitis neither the bromsulphalein nor van den Bergh tests are usually of value, unless in the presence of jaundice. However, in case 19 there was a 25 per cent dye retention at the end of thirty minutes, although a positive indirect van den Bergh reaction was absent. The patient had been jaundiced and a slight icteric tinge of the conjunctivæ remained, yet an excess of bilirubin had left the blood. The patient was operated upon a day after these tests were done and made a successful recovery. The quite high dye retention probably indicated a remaining hepatitis that may clear up in time.

In obstructive jaundice both the dye retention and indirect van den Bergh reactions are guides to the degree and progression or retrogression of the jaundice. In case 15, dye retention occurred when the tube left in the common duct became obstructed, and disappeared when free drainage was established.

SUMMARY

From this small series of cases it would be impossible to deduce any but the broadest conclusions. However, some very definite deductions may be drawn from this work.

1. That it is just as important to estimate quantitatively the amount of bile pigment in bilirubinemia or jaundice as it is to measure blood pigment in anemia, and that this can be done as accurately with the indirect van den Bergh reaction as with the hemoglobinometer.

2. That in differential diagnosis the tests are still of doubtful value, both in regard to the various reactions of the van den Bergh method and the bromsulphalein or dye retention procedure. In three cases of metastatic cancer we have failed to obtain dye retention, even in the most extensive liver involvement, whereas high authority has considered the test of much value in detecting the earliest stages of hepatic carcinomatous metastasis.

Again, in atrophic portal cirrhosis retention of bromsulphalein in the blood was marked in some cases but wholly absent in others, so that absence of dye retention does not exclude a diagnosis of portal cirrhosis.

Great advances will probably be made in the perfection of liver function tests and pioneers in this work, as Rowntree and Abel some seventeen years ago, deserve our highest admiration, but the present state of our knowledge of these procedures does not admit of much dependence being put on them for the purpose of differential diagnosis. History, physical examination, symptoms, signs and experience must still remain our chief reliance in diagnosis of liver disease.

It should not be inferred, however, that we consider the liver function tests valueless. Quite the contrary, we firmly believe that they will prove more and more useful as they receive wider recognition, and that both their indications and limitations will become clearer and more definite with the passing of time.

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NEWER METHODS IN THE TREATMENT OF DISEASES OF THE HEART*

Frederick A. Willius, M.D.
ROCHESTER, MINN.
Section on Cardiology, Mayo Clinic

Great progress has been made during the last decade in the understanding of diseases of the heart. This has resulted from ever increasing investigations and the more extensive use of instruments of precision, such as the electrocardiograph. The World War did much to stimulate and renew the interest of many physicians in cardiology, as many splendid opportunities were available during this time for intensive training and research along these lines. Progress in therapeutic methods in any field is, of course, directly dependent on a better understanding of the function of the organs in question, under both normal and abnormal conditions.

In considering the progress that has been made in the treatment of diseases of the heart during the last few years, it is very difficult to conclude which of the various agents has contributed the most. They vary in purpose and mode of action, and all have been important adjuncts in the progress of cardiovascular therapeutics.

Quinidin. The introduction of quinidin as a therapeutic agent in heart disease has been a very important contribution. Wenckebach (1914) first called attention to the value of this group of drugs in abolishing auricular fibrillation. The circumstances of the first observation dealing with the drug are of practical as well as of historical interest. A patient with auricular fibrillation was receiving quinin for the treatment of malaria and volunteered the information that shortly after taking a dose he was aware of a slowing of his heart rate and the return of regular beats. This fundamental observation paved the way for the more practical use of the drug in the form of quinidin by Frey (1918).

During the early period of the use of quinidin innumerable publications appeared, many dealing with very small series of cases, which resulted in much difference of opinion and confusion. However, now that more time has elapsed and greater experience has accumulated, quinidin is used quite generally, in a more conservative manner and with greater understanding.

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In about half the cases of heart disease accompanied by auricular fibrillation, the administration of quinidin will restore normal rhythm in a relatively short time. The specific actions of quinidin on heart muscle are briefly: (1) depression of contractility, (2) depression of conductivity, (3) depression of stimulus production, and (4) prolongation of the refractory period. Vagal paralysis may occur.

It is necessary to appreciate fully the nature of auricular fibrillation in order to understand the rationale of quinidin therapy. Lewis and his coworkers, by careful and exhaustive experimentation, have shown the close relationship of the mechanisms producing fibrillation and flutter. Both conditions have for their basis an abnormal area of stimulus production, that is, a circus movement following a central path in the auricle. The resulting disorder depends on the degree of coördination of the abnormal mechanism. Pure flutter is that condition in which there is extraordinary regularity of auricular contractions and in which the excitation spreads uniformly over the auricle from cycle to cycle. Impure flutter is similar, but less regular, due to dissemination of excitation in a less uniform manner. Fibrillation results from a more incoordinate status of the latter. Lewis has shown that in the fibrillating heart, under the influence of quinidin, a slowing in the rate of auricular oscillations occurs and the ventricular rate is increased, until in certain cases the lengthening of the refractory period over the conduction time abolishes the circus movement and permits the pacemaker to resume its normal function.

Many patients with auricular fibrillation are definitely improved after the restoration of normal rhythm by quinidin. It must be remembered that auricular fibrillation is sometimes transient or a paroxysmal disorder and that normal rhythm may ensue without therapeutic intervention. This is particularly true in cases of exophthalmic goiter. Some of the brilliant results attributed to quinidin have occurred in such cases, but it is very doubtful whether the drug was in any way responsible.

The method of administering quinidin is of importance and deserves special emphasis. Quinidin sulphate is best given in capsules in 0.4 gm. doses every four hours day and night. By a study of the changes in the auricular and ventricular rates produced by a single dose of quinidin, it has been shown that the heart recovers so rapidly from the effect of the drug that it must be given at frequent intervals. Failure to restore normal rhythm is often due to the fact that the drug is not administered during the night. Weichmann has shown that quinidin is chiefly eliminated in the urine and that its elimination begins quickly and is greatest during the first twenty-four hours. It is well to give several smaller doses first to determine the patient's tolerance to the drug.

Not infrequently during the administration of quinidin the ventricular rate becomes so rapid that the drug must be discontinued before distinct therapeutic effect is evident. This complication may often be avoided by the administration of digitalis first, since digitalis produces block at the auriculoventricular junction. It is always important to have the patient at complete rest in bed during the period when quinidin is first administered, as effort, excitement, and any factors increasing heart rate tend to interfere with the favorable action of the drug.

There are certain hazards and disadvantages connected with the use of quinidin in cases of auricular fibrillation, and their full appreciation is of great importance. If we briefly recall the mechanics of auricular fibrillation, one of the greatest dangers of quinidin becomes at once apparent. The auricles in fibrillation are no longer dynamic; they are distended in diastole and act more or less as passive reservoirs in the general circulation. They are emptied and filled chiefly by the suction action of the ventricles and by the pressure in the venous system. This status predisposes to the formation of mural thrombi in the auricles and detachment of particles from these thrombi is rendered more probable by the restoration of the dynamic function of these chambers. Therefore, before quinidin is used in cases of auricular fibrillation of rather long standing the possibility of producing emboli, which may result fatally, must be seriously considered. This danger is particularly great when cardiac decompensation has recently occurred or is present, especially in the presence of mitral stenosis. Sudden death from respiratory paralysis has been observed occasionally.

Another objection to quinidin is the uncertainty with regard to the heart rate after the abolishment of fibrillation. If the newly established normal rhythm should be attended by a rapid rate, considerable difficulty might be encountered in its control, as it is well known that a rapid regular heart rate does not respond as well to digitalis as does the rapid ventricular rate of auricular fibrillation. In quite a large proportion of cases of chronic auricular flutter that fail to respond to digitalis, quinidin has been very helpful in restoring normal rhythm. We have only employed quinidin when digitalis has failed to produce the desired results.

In many cases of extrasystolic arrhythmia much relief is afforded by small doses of quinidin. We have observed no untoward effects from the drug in these cases.

Occasionally patients with paroxysmal tachycardia receive considerable benefit from quinidin administered over quite a long time. The attacks are at times so modified that they occur less frequently and are of shorter duration and of lesser intensity; and occasionally they cease completely.

Theobromin. In 1924 we became interested in the use of theobromin in cases of angina pectoris associated with coronary sclerosis. Loeb as early as 1903 reported experimental data dealing with perfusion studies, indicating an increase in the rate of perfusion with theobromin.

The caffein group, of course, has been quite extensively used from time to time in the treatment of heart disease, but theobromin, one of its members, deserves reemphasis and continued investigation. We must not confuse theobromin with theobromin-sodium-salicylate (diuretin), an agent which has been quite generally employed as a diuretic. The latter drug contains only 50 per cent of the alkaloid, theobromin, and does not give as satisfactory results in cases of angina pectoris.

In selecting theobromin as a therapeutic agent for angina pectoris we had hopes of increasing the coronary blood flow, as suggested by the experimental studies of Loeb. We had abandoned the idea, quite prevalent at one time, of relieving the painful seizures by a drug that would exert an influence in dilating the coronary vessels. It seemed incredible to us that a sclerosed vessel could respond in this manner.

The first patient that we treated with theobromin was under observation in March, 1924. The patient was a man, aged fifty-six, who had had typical anginal attacks for two years. They became progressively worse and at the time of his admission to the hospital the attacks occurred when he was at complete rest in bed, and were precipitated by the ingestion of a very light meal. The heart was moderately enlarged; the tones were rather distant and lacked definition. A moderate degree of peripheral arterial sclerosis was present. The systolic blood pressure was 132, diastolic 84. At the beginning of treatment 0.3 gm. of theobromin was administered in capsules with an equivalent amount of sodium bicarbonate three times daily. The alkali was added in order to increase the solubility of the drug. After ten days the attacks became fewer and less severe, and at the end of three weeks had entirely subsided. By restricting his subsequent activities and following a systematic cardiac regimen this patient has remained entirely free from pain, as he reports by letter each month. Marked improvement has been noted in about a third of the cases treated during the two-year period. Failure of the drug is probably due to very extensive arterial damage and to lack of coöperation on the part of the patient in adhering to restrictions.

We have repeatedly seen electrocardiographic abnormalities disappear during the administration of theobromin, additional evidence of its therapeutic action. We have seen no marked evidences of diuresis and as yet no instance of gastric intolerance to the drug. Likewise, there has been no appreciable acceleration of heart rate except when decompensation existed, and our experience so far leads us to consider decompensation a definite contraindication to the use of theobromin.

The recent pertusion experiments of Smith, Miller and Graber, in which caffein sodium benzoate, theobromin-sodium-salicylate, theophyllin and euphyllin were used, are of interest. No appreciable effect on the coronary blood flow was evident with caffein sodium-benzoate or theobromin sodium-salicylate, whereas with theophyllin an increase of from 20 to 45 per cent occurred, and with euphyllin, the increase was from 40 to 90 per cent. Euphyllin, in addition to increasing the coronary flow, increased the amplitude of cardiac contraction for a short time, and accelerated the rate from twenty to thirty beats each minute. Euphyllin is a drug combination composed of theophyllin 80 per cent and ethylenediamin 20 per cent.

We are now giving euphyllin a thorough trial and it may possibly supplant theobromin in the treatment of angina pectoris.

Novasurol. Novasurol has been a valuable adjunct in the treatment of heart disease, having a diuretic effect and often relieving edema when all other measures fail. It is a double salt of sodium mercurichlorphenyl oxyacetate with diethylbarbituric acid. It contains 33.9 per cent of mercury. The drug was first introduced by Zieler, in 1917, as an agent for the treatment of syphilis.

The first article dealing with the use of novasurol in this country was published by Neuhof in 1924. Through Neuhof's plaudits of this preparation we began our studies of novasurol in the treatment of the refractory edema of heart disease early in 1924.

Regarding the diuretic action of novasurol in cardiac edema, Saxl and Heilig found that sodium chlorid and water were quickly excreted, that the diuretic effect of the drug depended but little on the amount of water or sodium chlorid in the blood, that the drug mobilized the water and sodium chlorid in the edematous tissues and organs, and that atropin and large amounts of salt given internally interfered with the diuretic action of novasurol.

Nonnenbruch and Mühling demonstrated that novasurol caused an increase in the excretion of chlorids in the urine in normal persons, but that diuresis did not always occur. This finding has been confirmed by Keith and Whelan, who also found that a relative and an absolute increase in the output of sodium in the urine occurred. No constant chemical changes in the blood have been demonstrated following diuresis.

The action of novasurol, so far as is known at present, is to cause a definite increase in the excretion of sodium and chlorin in the urine. It has not yet been determined whether this specific action occurs in the kidney only, or whether the tissues in general, or both, take part in the process. Keith, Barrier and Whelan have shown that many times when novasurol alone fails, combined with ammonium chlorid it brings about the desired effect. Novasurol has also been found to be very efficacious in the treatment of ascites complicating hepatic disease, as indicated by the work of Rowntree, Keith and Barrier.

Before administering novasurol, when edema was a complication of cardiac disease, we have always first subjected the patient to complete rest in bed, restricted fluids and salt, controlled the diet, and used digitalis. If benefit was not apparent within a week, novasurol was given. It is administered in doses up to 2 c.c. intramuscularly or intravenously at intervals of from two days to a week. It is well, first to determine the patient's tolerance to the drug, by injecting 0.5 c.c. intramuscularly.

The best results with novasurol have been obtained in the rather advanced cases of cardiopathy of the myocardium, with generalized edema, hydrothorax, ascites, pulmonary edema and distension of the liver. The types of dropsy associated with heart failure from valvular defects, particularly mitral stenosis, invariably respond quite readily to digitalis and the usual cardiac regimen. It is, of course, necessary to restrict fluids and salt during treatment with novasurol; fluids are restriced from 800 to 1000 c.c. in twenty-four hours, and the diet is made as nearly salt-free as possible. The two striking contraindications to the use of novasurol are acute glomerulonephritis and enteritis. Not infrequently during the course of administration diarrhea occurs, but this symptom has never been troublesome. Occasionally stomatitis and gingivitis occur, but as a rule are of short duration.

Ammonium chlorid. Keith, Barrier and Whelan have shown that the administration of ammonium chlorid in some cases of nephritis with edema produces marked diuresis. We have since used this drug in certain cases of cardiac edema and have at times obtained very striking diuresis, particularly in cases complicated by nephritis.

Keith and his coworkers have shown that in every case in which ammonium chlorid was given, two characteristic chemical changes occurred in the blood plasma; a fall in the carbon dioxid combining power, and a rise in the chlorin content. Their observations confirmed those of Haldane in showing that the ingestion of an adequate amount of ammonium chlorid diminished the normal alkali reserve in the blood and tissues. They further found that the urine during diuresis always showed the hydrogen-ion concentration to be below 6.0, varying from 5.8 to 4.6, the urine becoming decidedly more acid in from two to six days after the administration of ammonium chlorid was begun. The striking effects produced in some cases by the concomitant administration of ammonium chlorid and novasurol have already been mentioned.

Ammonium chlorid is given by mouth in doses of 6 to 10 gm. daily, for periods of from three to eighteen days. It is best given in keratin-coated pellets in 1 gm. units, and we have been giving the total daily dose at one time. If nausea occurs, the drug must be discontinued temporarily. Keith has pointed out that when the alkali reserve of the blood is markedly decreased, ammonium chlorid should be discontinued until the plasma bicarbonate becomes normal.

Desiccated thyroid extract. In 1916 Blackford and Willius reported four cases of complete heart-block with Stokes-Adams' seizures in which the patients were benefited by the administration of thyroxin (known then as alpha iodin). The alleviating of the cerebral phenomena of complete heart-block by thyroxin was at that time attributed to acceleration of the idioventricular rate, but further study and the accumulation of more detailed data on a much larger group of cases made this conclusion no longer **tenable.**

Aub and Stern, in 1918, reported a case of complete heart-block in which thyroid extract had been given. They found acceleration of the rate of the auricles, but no change in the frequency of the ventricular contractions.

A careful analysis of a large group of complete heart-block, in which thyroxin or desiccated thyroid extract was given, failed to show any appreciable acceleration of ventricular rate, yet invariably the Stokes-Adams' seizures disappeared, or at least were less severe and less frequent. It was evident, therefore, that other factors were instrumental in the alleviation of the periods of cerebral anemia.[45] The factors responsible for the clinical improvement in patients having the Stokes-Adams' syndrome are explained in the recent advances made in the physiology of the thyroid.

Kendall, in 1914, isolated thyroxin as a pure chemical compound from the thyroid; in 1917 he determined its empirical formula, and in 1918 proved its structural formula. Plummer, in 1917, brought forth the concept that thyroxin is active in all or nearly all of the cells of the body, and that it is a catalyst, increasing the rate of formation of a quantum of potential energy available for transformation on excitation of the cells.

Benedict, Lusk, Dubois, Means, Boothby and their associates, by their calorimetric studies, have aided materially in crystallizing knowledge pertaining to the physiology of the thyroid. It has been shown that the basal metabolic rate is constantly elevated beyond normal limits in exophthalmic goiter and in hyperfunctionating adenomatous goiter. The basal metabolic rate in an adult man without the thyroid gland, is from 30 to 42 per cent below the average normal. Plummer has shown that the rate may vary from 42 per cent below the normal average to at least 100 per cent above, depending on the thyroxin content of the tissues. He has shown further that the human body contains about 14 mg. of thyroxin, and that in normal persons the amount varies within relatively narrow limits. An increase or decrease of approximately 1 mg. in the thyroxin content of the body causes a corresponding alteration of 2.8 per cent in the basal metabolic rate.

Studies of the cardiovascular reactions in cases of exophthalmic goiter and of hyperfunctionating adenomatous goiter throw light on the rationale of thyroid medication for Stokes-Adams' disease. Plummer, and Willius and Boothby have shown that definite physiologic cardiovascular reactions accompany the elevation of the basal metabolic rate in both thyroid disorders. These reactions cannot be considered here in detail, but consist chiefly of an increase in the rate of circulation, brought about by acceleration of heart rate, and an increase in the volume outflow for each beat, facilitated by a relatively relaxed peripheral arteriocapillary system.

Since the ventricular rate of the heart is not increased with complete heart-block, an adequate circulation-rate must be maintained by other means. Marked changes in blood pressure occur in cases of established complete heart-block. In thirty cases of complete heart-block the average systolic blood pressure was 171, the average diastolic pressure 72, and the average pulse pressure 99. In several cases the systolic pressure was well above 200, yet there was no basis to interpret the readings as indicative of vascular hypertension, as the normal diastolic readings pointed to a normal peripheral arteriocapillary circulation. These readings were indicative of a large volume outflow for each beat.

Mackenzie attributed the phenomena of the Stokes-Adams' syndrome to ventricular stoppage, yet we are led to believe that another mechanism may also be instrumental in certain cases. We have observed typical Stokes-Adams' seizures associated with ventricular slowing (40 to 50 beats each minute) in a group of cases without heart-block. The cases conform to the clinical type of disease designated as cardiosclerosis, in which the sclerosis is rather diffuse or in which there is fibrosis of the myocardium. It is probable that, as the result of the fibrotic myocardial changes, underfilling and therefore diminished volume outflow for each beat at times is so great as to cause cerebral anemia.

The use of thyroxin or desiccated thyroid in the treatment of the Stokes-Adams' syndrome produces a beneficial effect by increasing the basal metabolic rate, which in turn increases the circulation rate. The increased circulation rate is accomplished largely by increasing the volume output of blood for each beat from the left ventricle, and is facilitated by a normal or relatively dilated peripheral arteriocapillary system. In no instance have we observed the disappearance of the block under this treatment. Any good thyroid preparation may be used with equal benefit to the patient, provided its potency is known by experience. In most preparations of desiccated thyroid extract, 1 or 2 grains is equivalent to 1 mg. of thyroxin. The dosage of thyroid may be established empirically and under guidance of the clinical symptoms, but it is far more satisfactory to follow the whole course of the treatment with frequent, accurate determinations of the basal metabolic rate.

The basal metabolic rate should be taken several times to establish the normal average definitely, and the dose of desiccated thyroid must be limited to prevent the rate from exceeding the upper limits of normality (+10 per cent). Experience has taught that the dose of thyroxin usually appropriate for the Stokes-Adams' syndrome is from 1 to 2 grains of desiccated thyroid extract (0.8 to 1.6 mg. thyroxin) daily. If, however, the rate is reduced below normal limits before treatment is instituted, a larger dose is obviously necessary. Certain patients do not readily absorb thyroid from the gastrointestinal tract, and therefore require a larger dose.

It is not advisable to administer thyroid extract, if cardiac decompensation exists, as the increased work cast on the heart by the elevation of the metabolic level would tend to favor the development of myocardial failure.

Barium chlorid. Recently Cohn and Levine have suggested the use of barium chlorid in alleviating the Stokes-Adams' seizures of complete heart-block. Their application of this drug is based on the work of Rothberger and Winterberg who showed that barium and calcium administered intravenously produced premature contractions and ventricular tachycardia by increasing the irritability of the ventricles. In view of the fact that the cerebral phenomena of complete heart-block are presumably due to periods of ventricular standstill and that the ventricles for the moment contain no mechanism for initiating stimuli, the authors tried barium chlorid in four cases and obtained very striking results. The drug was administered by mouth in doses of 30 mg. three or four times daily. It is probable that the drug is best administered intermittently.

Caution must be used in the administration of barium as all barium salts, except the sulphate are toxic in large quantities.[30] In appropriate dosage they exert a marked accelerating action on all muscular tissue and a gradual but sustained rise in blood pressure, although they may cause a depression, depending on the condition of the organs, and also on the presence of other substances. The elimination of barium takes place mainly through the bowels. The lethal dose of the drug is between 2.0 and 3.8 gm.

Glucose. The intravenous administration of glucose for heart failure is not a new measure but it is at times such a valuable therapeutic adjunct that its reemphasis is warranted. It is given on the basis of nourishing the heart muscle directly. It is known that next to the liver, the heart muscle normally contains relatively more glycogen than any other organ of the body, and it is probable that with myocardial fatigue, such as occurs in heart failure, a deficiency of glycogen in the heart muscle occurs. It has also been suggested that glucose attracts substances from the extravascular tissues, possibly salts, that are essential to tonicity of the heart muscle.

Glucose is said to supply fuel not otherwise available, due to defective carbohydrate metabolism,[34] and also to be useful as a supplement, or even as a substitute, for digitalis.[9]

Unquestionably much of the subsequent progress in our knowledge of the heart in health and in disease will result from studies of the heart's metabolism. This subject is extremely fascinating and permits endless lines of philosophic speculation.

We have at times seen remarkable benefit in cases of severe heart failure from the intravenous injection of glucose, after digitalis and other methods of treatment have failed. Glucose must be given as a hypertonic solution; a strength of 20 per cent is very satisfactory. The solution must be pure and perfectly sterilized, and should be administered very slowly. The amount injected at one time varies from 75 to 500 c.c., depending on the condition of the patient, his tolerance, and so forth. This method of treatment is not advocated as a routine in heart disease.

Sympathetic neurectomy for angina pectoris. Since Jonnesco's report of a successful case of sympathetic neurectomy for angina pectoris, a wave of enthusiasm has swept the world, and doubtless many operations have been performed when the indications were questionable. The enthusiasm for this procedure has been largely on the part of the surgeon.

Jonnesco removed the nerves of the left cervical sympathetic system and the upper thoracic ganglion. It is interesting to note the variations in operative technic that have been advised and the variations in the relief of symptoms that have been obtained. Originally Coffey and Brown severed the left sympathetic trunk below the superior ganglion and the superior cardiac branch. Later they always resected the superior cervical ganglion. Jennings and

Jennings and also Kerr report results from resection of the depressor nerve alone.

Virtually all the exponents of the operative method are fully in accord with Albutt's theory that the pain in angina pectoris results from pathologic changes in the root of the aorta giving rise to spasm. Some of the advocates of the operative method go so far as to state that their operation is based on the supposition that angina pectoris is due primarily to spasm of the aorta but that it may also be of the coronaries, for they are supplied by the same nerve systems of the sympathetics, and that the superior cardiac nerve has a constrictor action, and cutting it prevents the spasm.

They have entirely disregarded the theory of Mackenzie who believed that the pain of angina pectoris resulted from cardiac fatigue, resulting from interference with nourishment of the heart itself. Mackenzie's view, however, should not be disregarded, as it is the only one that gives a reasonable explanation of cardiac pain under all known pathologic conditions.

It is appropriate in this connection to set forth the views on this subject of the great clinician, Sir James Mackenzie. "The impression has got abroad that the feats of the surgeon are indications of the progress of medicine. When an operation is carried out with a full knowledge of the morbid conditions which it is intended to relieve, and with a knowledge of the functions of the structures which the surgeon cuts in his operation, there might be some reason for regarding such surgery as an example of the progress of medicine; but when the surgeon is profoundly ignorant of the morbid condition for which he operates, and of the functions of the structures which he mutilates, it is impossible to conceive anything more detrimental to progress. At one time the surgeon was supposed to have a knowledge which would enable him to make not only a diagnosis but a prognosis, so that he could tell whether his interference would be to the patient's benefit. But the trend of modern medicine with its specialism is that the surgeon dispenses with this kind of knowledge and relies upon others for instruction when to operate."

Sympathetic neurectomy is certainly a procedure that must only be undertaken after much forethought and deliberation on account of the risk connected with the operation and the uncertainty of results. One obvious objection to the procedure, even granted that the painful attacks are completely abolished, is the fact that the underlying disease process still remains and that the patient's one warning sign, pain, is eliminated. There is certainly no justification for the operation until all medical measures have failed.

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FRACTURES OF THE UPPER EXTREMITY AND THEIR TREATMENT*

W. A. Taylor, M.D.
ELLENSBURG, WASH.

The subject of fracture is as old as the human race and I will make no attempt to advance anything new. It is my desire to stimulate and renew interest in this very large and extremely important branch of surgery by calling attention to some outstanding facts and to remind you that the treatment of fractured bones has not as yet become a perfected science.

As the time allotted me is very short I shall not burden you with a diagnosis of the various fractures, as most of them now are diagnosed by the means of x-ray, or at least this is used to confirm the diagnosis. I believe it to be impossible to standardize absolutely the treatment of fractures, but certain general rules may be laid down which will be of considerable help.

FRACTURES OF THE LOWER END OF THE RADIUS

In discussing fractures of the lower end of the radius I will include fractures of the lower end of the ulna. It might be interesting to note that of one hundred fractures of the radius, approximately three will be in the upper third, six in the middle third and ninety-one in the lower third, a large majority of the latter being within one to two inches of the wrist joint.

It seems quite evident that many of the less severe fractures of the lower end of the radius, before the general use of the x-ray, were not recognized as fractures, that is, not considered Colles. Perhaps this was far better for the patient, for as I will endeavor to show later, some of these fractures afford a better prognosis by no treatment at all than would be the case if they were recognized by the x-ray and overtreated, as so often happens.

Fractures involving the lower inch of the radius are largely limited to middle and advanced life and a very large percentage occur after middle life. Very few fractures in this region are found in individuals under twenty years and when such an injury does occur it is prone to involve the epiphyseal line.

Fractures of the lower end of the radius may affect the wrist joint or they may also affect the radioulnar articulation. A study of the cross section of the forearm at the level of the radioulnar articulation will show how intimate is the association of various tendons and how they are brought into contact with the fractured radius at this level on both ventral and dorsal surfaces. This fact should be uppermost in the mind of the operator who is treating one of these fractures.

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* Read before the Thirty-sixth Annual Meeting of Washington State Medical Association, Seattle, Wash., Sept. 17-19, 1925.

In the discussion of fractures the term "pathology" seemingly contains only a picture of the various changes as the result of injury during the process of repair of the bone, while the ultimate outcome of a great many fractures depends more on the pathologic changes that occur in the soft parts. Not so much those that occur at the time of injury, but those which are prone to occur during the repair of bone. That every fracture of bone is complicated by injury of the surrounding soft part is a fact that needs no comment, but in some fractures considerable changes are thus produced, also inflammation, the severity of which is in direct proportion to the primary injury to the soft parts or as they may be aggravated by the treatment used.

When fracture occurs at the lower end of the radius or in any of the bones which make up the wrist joint, there is rarely any excessive primary injury to the surrounding soft parts, yet the structures are so numerous and lie in such close proximity to the injured bone that soon after the bone lesion occurs extravasation of blood and infiltration of leucocytes involve to a greater or less extent the delicate membranous lining of the numerous tendon sheaths and synovial cavities, which become roughened and lose temporarily that smoothness which permits free transmission of tendons. As the inflamamtion progresses, more or less effusion takes place into these structures and during the process of repair, if conditions are not favorable, how easily adhesions may form between the tendons, which will interfere very markedly with the free movement of the many structures that are so essential, to the normal function of this important joint. It is just these pathologic changes that are responsible for the large percentage of poor functional results. This is true in any fracture, but is especially important in fractures near joints.

The line of fracture and displacement of fragments in the lower end of the radius range very widely. When it is recalled that a large percentage of these fractures occur within an inch of the lower articular surface of the radius, it will be seen that a great many times the line of fracture will enter the radioulnar articulation. In a few cases the line of fracture will enter the wrist joint and in either case callus may be deposited over and about these surfaces, if precautions are not taken to prevent it.

Displacement of the fragments varies as widely as does the line of fracture. In no small proportion of these cases there is no appreciable displacement found, though the line of fracture may be complete and extend in almost any direction. On the other hand, the displacement may be so marked as to produce a very distinct change in the position of the hand and wrist as well as the lower articular surface of the radius. Two fragments are the rule, but there may be three, and many of the smaller fragments displaced in any direction.

The signs of the ordinary fracture and those of the Colles type are too well known to warrant repetition now, but there is one sign present here which is almost pathognomonic of fracture in any superficial bone, and that is the area of extreme tenderness along the line of fracture. Speed and others have called attention to this point, which is a very dependable sign in fractures of the ribs, those about the elbow, as well as in those under consideration. When all other signs of fracture are absent, a very definite diagnosis can be made in the early hours by finding this point of extreme tenderness. If all wrist injuries were x-rayed, there would not be so much truth in Miller's assertion that in no place in the body are serious injuries so frequently mistaken for minor ones as in injuries about the wrist joint. In all cases of injury the court of last resort, x-ray, should be universally employed.

Great stress should be laid on the importance of good reduction in these fractures, and all fractures which require a reduction should be reduced as soon as possible following the injury. The details of the methods of reducing Colles fracture are well known and easily found in the various text books; yet to assume that reduction has to be accomplished in all or most fractures of the lower end of the radius is wrong and a study of the various types of lesions will soon convince one that in a great many of these fractures the fragments are as near normal position as could be desired. However, in some of these fractures a good reduction or a perfect reduction is essential to secure good functional results.

Colles fractures, when not properly reduced at the time of the accident, result in more bad deformities than all other fractures combined. It is a well-known fact that fractures of the shaft of long bones with great deformity will unite and give good functional results, but it is not so with fractures about the joints and especially about the wrist. A good functional result is not enough, but a perfect anatomic result is also expected. A perfect functional result is scarcely compatible with anything less than a perfect anatomic result.

Proper immobilization in these fractures is essential, but some need very little, if any, while others may be immobilized for too long a period. These are facts that must be considered carefully when one of these cases presents itself for treatment. To treat any fracture without some immobilization apparatus is contrary to the principles which we see manifest in nature and that are employed during the repair of wounds in any tissue; yet I believe many fractures are too well immoblized and for too long a period. Fractures of the lower end of the radius may be immobilized by any material that will suffice to maintain the wrist joint in rigid position, but the wooden-padded splints or moulded plaster splints are unquestionably the most serviceable.

In fractures that are transverse or that are not complicated with displacement, anterior and posterior, padded wooden splints are very satisfactory. In the more severe types of fractures, in which there is a marked displacement or in which there is a tendency to displacement after reduction, these cases should be put up by the aid of the fluoroscope and the fragments should be manipulated into the best possible position and maintained in that position by strong moulded anterior and posterior plaster of paris splints. The advantage of these splints is that either splint may readily be removed for massage and a passive movement then reapplied readily. The replaced splint can be made as rigid and close fitting as desired by use of adhesive plaster and a roller bandage. The patient should be encouraged to flex and extend the fingers frequently after the first two or three days. Immobilization of the elbow in these cases should be discouraged.

It is with this type of fracture, as well as fractures of the forearm and to some extent fractures around the elbow joint, that brachial plexus anesthesia is so very satisfactory. With this form of anesthesia, which gives you complete relaxation, you have plenty of time to manipulate the bones under the fluoroscope; you have also the cooperation of the patient and the opportunity to readjust the splints as often as may be necessary.

The aftertreatment of these fractures from the time reduction is accomplished and the first splint applied is more important in securing a good functional result than is the first aid or the reduction and application of the first splints. To leave the arm immobilized for three, four, five or six weeks is only to court disaster.

That massage and early movement should be intelligently applied is an important feature and according to most advocates should be instituted between the second and seventh day. It should be repeated daily or every other day to the end of two or three weeks, when the splints should be removed entirely and active movement with massage carried out until full function is restored. These early movements should include pronation and supination of the arm in order to prevent adhesions from forming in the radioulnar articulation. This movement is quite important.

FRACTURES OF BOTH BONES OF THE FOREARM IN THE MIDDLE THIRD

Probably the greatest difficulty in securing good nonoperative results is in the matter of maintaining proper extension. On numerous occasions, on manipulation of the bone under the fluoroscope, we have noticed how easily and readily the fragments slip into the proper position when extension is applied, provided there is no muscle or fascia interposed between the fractured ends of the bones. To maintain this extension is sometimes a difficult matter. Usually the proper extension may be maintained with snugly-fitting anterior and posterior moulded plaster of paris splints, which include both the elbow and the wrist joint. The splint may be made as snug and tight-fitting as required by the aid of circular pieces of adhesive plaster. The arm being put up in a supinated position, however, in a considerable number of cases, despite the strong snug-fitting plaster splints, due to muscle spasm especially of the pronator radii teres and pronator quadratus, there will be enough torsion to produce a separation of the fragments. In these cases some other method of securing extension must be adopted and, were it not for the necessity of keeping these patients in bed during the process of repair, Korpman's method of extension would be very satisfactory. In these cases in which it is impossible to secure satisfactory reduction by the plaster of paris splint we have reduced these fractures by an open operation.

FRACTURES ABOUT THE ELBOW JOINT

The elbow joint on account of its complicated architecture is notoriously prone to fractures and to develop ankylosis following injury to its bony components or its surrounding soft parts. In connection with fracture of the lower end of the humerus let me call your attention to two important anatomic land marks. First, the inner condyle is placed at a lower level than the other when the arm is parallel to the erect trunk (by this arrangement the carrying angle is formed, a very necessary position to maintain after injury) ; second, the articular surfaces of the humerus are fastened to the shaft of the bone at such an angle (130°) that they point forward and downward instead of directly downward, as is generally supposed. A right angle reduction, therefore, neither brings forward completely the lower fragment nor produces the proper tilting angle to the articulation. This explains the reasonableness of the Jones - Ashurst hyperflexion treatment.

There are ten varieties of fractures of the lower end of the humerus. It is not my intention to describe these fractures, but merely to call attention to the fact that they may all be treated by the one method of fixation in very acute flexion, with the exception of those which are compound and badly communuted and where a severe infection is very probable. In these cases the arm should be put up at right angles.

Any flexion short of hyperflexion does not abolish the lever action of the forearm. In the position of hyperflexion the leverage of the forearm is completely abolished and the distorting influence of the muscles that span the elbow is largely eliminated. With the elbow in the acutely flexed posture, the triceps acts as a natural splint of the lower end of the humerus. It is closely applied to the humerus, covers the extension surfaces of the condyles, and spreads out beyond the joint in a broad and powerful aponeurosis. This action of the triceps in hyperflexion is one of the greatest advantages of the position.

Hyperflexion is as correct for the maintenance of the carrying angle as it is for the leverage. If the carrying angle is distorted as a result of fracture, it is well known that the axis of the forearm crosses that of the arm when the elbow is flexed. Limitation of motion in a well flexed elbow is the least disadvantageous form of limitation. From this view point hyperflexion is also the most desirable position.

Before the elbow is placed in hyperflexion, if possible, all displaced fragments should be reduced. However, this is not possible in all cases. The effect of attempts at reduction should be invariably controlled by the use of the fluoroscope during the reduction and by radiograms taken immediately after, in order to correct promptly any pronounced displacement that may remain.

Hyperflexion does not mean merely acute flexion; it is the most acute flexion in which the elbow can be fixed without obliterating the radial pulse. Varying with the amount of swelling at the elbow as well as with the muscular and adipose tissue of the arm, the angle at which the joint can be flexed generally ranges between twenty and thirty-five degrees. It is very remarkable to observe the extreme flexion obtainable in most instances of recent fracture. The time for fixation in hyperflexion is not when the swelling at the elbow has receded, but as soon after the fracture as the patient is seen. The best results are unquestionably attained in the most recent fractures.

The forearm is flexed upon the arm with the axes of both coinciding. In Ashurst's opinion it is immaterial if the forearm is in pronation or in supination. The patient is anesthetized to complete relaxation on a fluoroscopic table; the arm is abducted from the side and the fragments are manipulated into position. Care is taken that the carrying angle is maintained with the hand in a supinated position, that is, with the thumb turned outward. The arm is hyperflexed as much as possible without the obliteration of the radial artery, or until the coracoid process of the ulna fits into the coracoid fossa of the humerus, care also being taken that the axes of the arm and the forearm coincide. Anything short of this reduction will not be satisfartory. The arm is then fixed in this position by adhesive plaster, any way you wish as long as the bones are kept motionless. By this procedure the coracoid process of the ulna fills up the coracoid fossa of the humerus and leaves no room for bony growth which in future would inhibit flexion, and also acts as an anterior splint for that part of the bone. The tendon of the triceps acts as a posterior splint and thus the arm is kept motionless.

As in all fractures around the joints, in order to secure good functional results it is necessary that you have as near perfect anatomic reduction as possible. It does not make so much difference about the reduction of long bones, but in fractures around joints perfect reduction is essential. Also, it is as important to treat the soft parts to obtain good results as it is to treat the bone. For this reason, fractures should not be immobilized too long. I feel quite sure that the beneficial effects of physiotherapy in the after treatment of fractures is very much neglected. They should have the benefit of physiotherapy in the after treatment.

In treatment of fractures in the region of the elbow, Neuhof, in a review of one hundred cases, claims that the best results were obtainable when passive movement and physiotherapy methods were instituted within a week of the date of the fracture. These cases gave much better results than the fractures which were treated later. From ten to fourteen days after the fracture the arm can be lowered a few degrees every four or five days and this should be continued until the arm can be fully extended. However, during this mobilization, should the elbow stiffen so that the patient cannot obtain the initial degree of flexion, all movement should cease, the arm should again be put into a completely flexed position and maintained for another week.

FRACTURE OF THE OLECRANON PROCESS

Fracture of the olecranon process is one of the fractures around the elbow which may not be put in the form of hyperflexion as already described. In this fracture, which is usually caused by a fall on the elbow, where separation is not more than half an inch, extension and fixation of the elbow for two or three weeks, then gradual flexion, is probably the treatment of choice. If the separation is wide, then an open operation should be performed. Two to four weeks is about as long as the arm can be left in full extension without some danger of ankylosis of the elbow joint.

In cases of multiple fractures around the elbow which include the olecranon process, probably the best method would be to reduce and fix the fracture of the olecranon by open operation and put the arm up in acute flexion as in other fractures around the elbow joint.

FRACTURES OF HEAD OR NECK OF RADIUS

Fracture of the head or neck of the radius is relatively rare. There is no room in this part of the elbow joint for either the slightest displacement or excess callus. Either one may give considerable pain and muscular disability with the flexion of the elbow and rotation of the forearm. The fragment is usually displaced upward and forward and may be mistaken for a small piece of the external condyle. The elbow can be almost fully extended and flexed, but supination and pronation are limited. Treatment: full flexion for several weeks. As it is important to limit any excess callus, early movement is contraindicated. If there is actual obstruction to supination, the fractured piece should be immediately excised.

FRACTURES OF THE UPPER END OF THE HUMERUS

Fractures of the upper end of the humerus should be treated by extension, with the arm in the position of abduction and external rotation. This position unquestionably gives the best results.

These fractures are generally caused by a fall, the patient's arm being held in the position of abduction, hand pronated, the humerus inwardly rotated. As a result of this position the tuberosity of the humerus comes forcibly into contact with the tip of the acromion. It follows then that, first, the tuberosity is broken off; second, the tip of the acromion may be broken off; third, a fracture of the neck of the humerus occurs. This last fracture may be one of the five following varieties: first, fracture of the anatomic neck; second, fracture of the surgical neck; third, in young children there may be a partial or a complete separation of the epiphyseal line; fourth, a dislocation of the humerus may occur; fifth, a combination of the various preceding conditions may result.

In fractures of the great tuberosity alone there are two main types; one in which there is merely a crack running from the base of the tuberosity, and one in which the tuberosity as a whole is pulled forcibly off and rotated backward and outward. The latter condition is due to the pull of the supraspinatus, infraspinatus, and teres minor muscles. Any attempt to reduce this fracture in any position other than outward rotation, elevation and abduction of the humerus will, of course, fail. Phemister emphasizes the necessity in these cases of making roentgenograms with the arm in abduction and internal rotation. Otherwise, the large tuberosity overlaps the head, causing these fractures to be easily overlooked.

Associated with this type of fracture is always inward rotation of the distal fragment, consisting of the shaft of the humerus. This inward rotation is due to the unopposed pull of the pectoralis major, latissimus dorsi and teres major. There may also be some upward displacement of the lower fragment, due to the unopposed pull of the biceps, triceps and coracobrachialis. All these perverted muscle pulls have to be taken into consideration and corrected before any adequate anatomic reposition may be accomplished. The more severe types of these fractures are associated with capsular tears and injury to the subacromial bursa, with exudation into the joint and so add greatly to the subsequent disability.

Early motion is as much an essential to a satisfactory result as the primary corrected anatomic reposition. The results one sees in these cases treated by the usual routine methods are bad. That is, motions are always limited in abduction, outward rotation and elevation, with little or no ability to put the hand behind the head for a long time, eight or ten months, if ever.

Early traction in abduction and outward rotation with a right angle elevation would give the patient a base from which to start these motions and would ultimately lead to vast improvements in our results. One principal difficulty in effecting outward rotation, abduction and elevation in this type of injury following the old method of treatment, is that new bone and exuberant callus blocks the sliding of the greater tuberosity under the acromion. With the arm in the primary position of outward rotation, abduction and elevation, no such blocking callus can form and the principal difficulty to later function is removed.

In a large percentage of cases of fractures of the head or neck of the humerus there is a little tendency to displacement after reduction and thus in these fractures a small amount of traction is all that is necessary.

There are several methods of applying traction to the humerus, following manipulative or operative reduction of the fracture. Most of the ambulatory splints on the market at the present time are insufficient, not so much from the viewpoint of traction as from the fact that the humerus is always held in inward rotation and generally in a plane forward of the shoulder joint.

Following a fracture of the upper end of the humerus which has been reduced under ether anesthesia, the traction may be applied to the arm in the usual manner: first, two long side pieces of surgeon's plaster parallel to the long axis of the arm. If the patient is to stay in bed, the ordinary Thomas arm splint may be used and so fastened to the head of the bed with a bandage as to prevent dropping of the arm below the shoulder level. The end may be supported on a bedside table or slung from an overhead support. Care should be taken in these cases not to extend the sticking plaster below the elbow, as too much or too long continued traction or even sufficient traction to hold the fracture in adequate position and overcome muscle pull may be enough to start up an arthritis or a periarthritis of the elbow which will prove very troublesome for a long period of time. It is better to have the elbow flexed and the hand supinated and all the pull coming on the upper arm.

Second, if the lower arm is incorporated in a plaster cast with the elbow bent, the cast extending a few inches above the elbow, traction can be made on the cast in the bend of the elbow without danger and with excellent control of the traction and rotation. From ten days to two weeks is sufficient time to insure enough union so that the patient may be allowed up and about with an ambulatory splint which maintains the corrected primary position. This splint can be applied in all simple cases of impaction from the first, but in the more severe types of fractures, especially those which have required manipulative or operative reduction, the patient is more comfortable and safer in bed the first week or two.

For this fracture an ether anesthetic with complete relaxation is the most satisfactory, the patient being placed on a fluoroscopic table before the anesthetic is begun. For a number of years in all cases in which there appeared to be a possibility of difficulty in reduction, we have reduced all fractures by the aid of the fluoroscope. I am quite sure that results would be greatly improved, if this method were followed in the difficult cases of fracture. Several times by the aid of the fluoroscope we have reduced fractures which from the x-ray plate appeared to be almost impossible, and in this way open operation has been obviated.

While practically all cases of fracture of the upper end of the humerus may be satisfactorily put up in the position of abduction, extension and internal rotation, there will be an occasional case to which this method is not applicable. It is a fact of common knowledge that, when any tissue or material is stretched beyond its tensile strength, the elasticity and strength of that tissue will not again return to normal. In fractures of the upper end of the humerus which are complicated by dislocation or other serious injuries to the capsule of the joint, the capsule may be so stretched that when rotation outward is attempted the head of the humerus will slip out of the glenoid cavity of the scapula. Such a case recently came under our observation and in this case after two or three attempts of external rotation it was necessary to dispense with this part of the procedure and put the arm up in a position in which the head of the humerus would remain in the glenoid cavity.

FRACTURES OF THE SHAFT OF THE HUMERUS

Fractures of the shaft of the humerus may be put up in the same way as fractures of the neck; that is, by abduction, extension and external rotation. The amount of abduction required depends on whether the fracture is above or below the insertion of the deltoid. By the aid of a fluoroscope and a modified aeroplane splint with traction and countertraction, the fragments are manipulated, abducted and rotated into position and enough extension applied to maintain the required length. In fractures of the neck of the humerus very little extension is required in most cases, but in fractures of the shaft of the humerus, extension equal to two and one-half to five pounds is usually required. The fixation for the extension may be obtained by the methods described in fractures of the neck of the humerus.

CONCLUSION

In conclusion let me state briefly what I consider to be the important factors which make for good results:

1. The aid of the fluoroscope in reduction.
2. Brachial plexus anesthesia in fractures of the arm.
3. Early accurate reduction and early mobilization.
4. The more general use of physiotherapy methods in after treatment.

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Recognition and Management of Cardiovascular Surgical Risk. Alfred E. Phelps, New York (*Journal A. M. A.*, June 12, 1926), has made a cardiovascular appraisal of patients of 50 years of age and over on whom major operations were performed. No patient was included who was a poor risk as a result of a surgical condition. All the patients without symptoms and without signs of cardiovascular impairment withstood the strain of a major operation. All the patients with mild symptoms and signs of cardiovascular impairment also withstood the strain of a major operation. Of six men with advanced symptoms and signs of cardiovascular impairment, three died; of two, operations were curtailed; one did well. Two women with advanced symptoms and signs of cardiovascular impairment did well. Transfusion of whole blood is the most effective method to prevent and combat surgical shock.

FRACTURES OF THE LEG*

H. E. Cleveland, M.D.
BURLINGTON, WASH.

In the State of Washington, and nearly all the Pacific Coast states, we see large numbers of fractures, especially of legs, due to immense logging industries, railroad and camp work, clearing of logged-off lands, and today we have everywhere the traffic accidents. There is no work in surgery that requires more constant personal attention over long periods of time than fractures, nor is fraught with more unsatisfactory results both to patient and surgeon.

This paper is not written for the specialist who has everything at his command, as appliances, hospitals and assistants, but for the local country surgeon who has unskilled help and very few appliances to work with. For a fracture to do well, it must be set at the earliest possible moment, both to restore circulation and prevent injury to soft parts by long continued pressure of misplaced bones against vital structures.

We will try to give a standard method, which will apply to greater number of cases, termed the "split cast method" of retaining fractures, which we brought out in an earlier paper several years ago, read before the tricounty medical meeting at Mt. Vernon, and which has served admirably. This method applies principally to the lower leg, although the method of making the cast is the same for use in every part of the body whether a Colles or fracture to tuberculous spine.

It is not hard as a rule to set most fractures, but it is very difficult to maintain the same. First, we must not have too long continued pressure on any one point; joints must not be immobilized too long, as there is a tendency to produce ankylosis, although not as great as is commonly believed.

The patient is brought in, or you are called to the place of injury. He is suffering great pain, and in compound fracture shock. Give hypodermic of ¼ to ⅜ grain morphin, with scopolemin, 1/150 or 1/100, or you may carry the small tablet with you of hyoscin-morphin-cactine, which acts practically the same. There is nothing that quiets the patient or stops the nervous shock like the above. Remove all clothing, straighten out the legs under traction. This helps restore circulation. Let patient rest. Give yourself time to think, then decide what to do.

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* Read before the Thirty-sixth Annual Meeting of Washington State Medical Association, Seattle, Wash., Sept. 17-19, 1925.

First thought is, where you are going to have the patient. In hospital, if possible, by all means, but in out-of-the-way places, as in the mountains, hospitals are oftentimes a long way off, although the automobile has cut down distances. Next, get a good x-ray of condition, which always means two positions. If unable to obtain the same, do not worry, as some of our best work was done before there was an x-ray machine invented or near enough to use. If well used, it is fine, but if poorly used, it is the biggest lying proposition we ever had.

Compare the leg with the opposite extremity. Use your tape-measure; bring leg into exactly the same position so as to have the same anatomic appearance as the other; feel your bones, see if you get good crepitation; hold in that position. This can be done in many ways. If you have one of these transportable Hawleys, it is beautiful, but otherwise always have a pair of tongs; they are inexpensive. Take a sheet, corner to corner, pass through crotch, up over shoulders and fasten stationary. Before the advent of tongs, we used a vulsellum or towel clip, took a good bite in the plantar surface of the heel—anything to retain a constant position until retention splints were properly placed.

Exhibit A shows all that is needed to set any form of fracture of the lower leg. No. 3 is a can of plaster. This is practically an air-tight container, such as No. 10 Cloverleaf dental plaster comes in. We carry this with about four inches of plaster in the bottom, leaving room for No. 2, our supporting splint, which is made of No. 1 crinoline taken from the ordinary ten-yard adhesive rolls. For the average man it is about thirty-five inches long, made of eight thicknesses of crinoline. After plaster is worked in, fold triple; this makes thirty-two thicknesses. This should extend from the ball of foot to the beginning of the upper third of thigh.

No. 4 shows the four-inch plaster bandages. We make all of ours with ordinary four-inch bandage. We do not believe anything smaller should be used on long bones of the leg because of smaller bandages cording. Also in No. 4 is a bottle of vaseline, which we believe in using whether leg is shaved or not. Spread on thickly; it tends to keep the skin from sticking and makes the plaster easy to remove and keeps down blisters.

No. 5 is the ordinary tongs. A word about tongs. Dr. Langworthy of Spokane has a tong that in setting fractures of the thigh, using the Thomas splint, permits of full extension, while these do not.

No. 6 is a pocket cigar cutter which can be bought anywhere; it contains the autostrop safety razor blade. That is used to cut the plaster while still green, or what we call splitting casts.

No. 7 is a bowl, containing plaster with a scoop showing, to which a little water is added and used in smoothing off or finishing up casts. Wash bowl and pitcher are self-explanatory. Have a deep basin in order to fully submerge plaster dressings.

Exhibit A is packed ready for travel. The bandages, scoop and plaster are all inside; simply vaseline and tongs are outside. It shows what a compact equipment you have with which to travel, as it can be carried on pack-horse into hills if necessary.

Exhibit B shows absolutely all that is necessary to take off any plaster cast, while green. It can be carried in the pocket. Use the rough toothed instrument for grooving your casts, taking your dropper and filling the groove with acetic acid just for a few minutes. Then your little pocket safety razor blade will carve the cast as easily as when green. For very heavy casts we use a heavy, sharp jack knife. In this way all cumbersome scissors, saws and appliances that are sold for a large amount of money are done away with.

1. First picture shows leg of a timber worker, compound comminuted fracture being set. It shows tongs placed in os calcis, close to insertion of gastrocnemius muscle to overcome contraction (the cause of which is muscle spasm), and holds the leg stationary while applying the cast. The leg has been washed with lysol solution, then greased with vaseline, supporting splint applied posteriorly, directly to leg. Cyanide dressing over wound and circular plaster bandages are applied directly to skin, around and over the supporting splint, no sheet wadding or felt being used. If the leg is set perfectly, it will remain that way. It stops all motion, and therefore pain, so there is no tendency of contraction of muscles. Keep the leg supported at point of fracture to prevent any sagging posteriorly, as a leg that bends backward is always weak, easily tired and unsatisfactory, while a slight bend forward never gives trouble.

If there is no temperature above 101°, which you will get from absorption of blood clot, it does not mean bone infection. We never disturb these legs for days or even weeks. Every time you move the bones in a compound comminuted fracture the first week or ten days of injury, you will generally get chilliness and rise of temperature, showing that you are causing a spread of infection. In our earlier practice we used to drain, irrigate, etc. Our results were bad much oftener than now. In fact, now we seldom see infections.

2. This is a picture of the same patient in hospital with a compound comminuted fracture of the tibia, showing first dressing three weeks after fracture was set. It shows the split-cast as it was split at time of fracture; upper end not split, as this after splitting becomes very loose and pliable. The stain on the cast is the blood soaked through. This picture shows upper part of cast just being split preparatory to examination three weeks later, with acetic acid and small dropper and knife showing the groove. The cast cuts easily, like paper.

The cast spread open shows point where logging tongs hit leg with gaping wound, dressing removed first time in three weeks. When this dressing was first placed on, there was nothing used but the ordinary hospital sponge, saturated with one 7½ grain tablet of cyanide of mercury with sodium borate to one pint of water, and one pint of alcohol solution, a quart in all. This we have used for years on these compound fractures and have had very little trouble. This patient's temperature never went over 101°, and this was twenty-four hours after accident; it then dropped. Temperature is often up for a day or two.

3. This picture shows the supporting splint and also shows how easily the leg bends after three weeks.

4. A picture of a young man struck by an automobile four weeks before; bad compound comminuted fracture, bones sticking out through trousers. It was set by the same method. The skin wound was opened up a little wider with scissors, bones thrown out into air and thoroughly cleansed with lysol solution. (This means lysol, not liquor cresolis compositus, or some other concoction made up to represent lysol.) Leg was set by using tongs, set in the ward of the hospital. Gloved finger was passed into wound, feeling bones down to place of fracture. (All compound fractures we explore and set with finger on bone.) Tongs are pulled over foot of bed, as shown in one of our preceding pictures. This patient never had any fever.

First dressing four weeks after accident, cast cut off showing the knee motion. From now on his ankle and knee will be moved every day, simply using the splint for protection while up on crutches and taking it off at night. Complete bony union will result at end of four weeks; complete ankle and knee motion. To recapitulate, the leg had better be bucking forward than to be sagging backward. A leg that sags backward is always a tiresome proposition and never satisfactory.

A compound comminuted fracture must be kept absolutely quiet. The idea of dressing and meddling with these fractures, unless the patient shows a temperature, is absolutely wrong. Bad crushing fractures, as a rule, will of necessity have to be handled by a Thomas splint and extension with tongs, until you see if you are going to lose the leg. Twenty-four to seventy-two hours will generally decide this. To keep down infection, it has been proven in our late war that the use of the Carrel-Dakin solution is best. We keep these wounds under irrigation every two hours during this time. If, after watching your case twenty-four hours, you find the circulation is not returning into the foot or toes, early amputation is indicated.

In all our cases of compound wounds, we administer antistreptococcic and antitetanic serum immediately. If we do not amputate the foot or leg, we put on split-cast, reinforced with aluminum wire to provide for cutting, if we feel the need of irrigation.

FRACTURES OF THE THIGH

Fractures of the thigh can be handled best in the Thomas splint, using tongs in the condyles for skeletal traction and watching with the fluoroscope, changing the tongs by use of novocain to get the proper tilt to the segments. and using the pressure pads that come with all modern splints. With fractures of the thigh that are not retained easily, as near the joint, I have had very good results with Lane plates and autogenous bone transplants. Casts are not satisfactory on the femur. Plates or transplants have not given as good results in lower leg with us, as do split-casts.

In addition to the two cases before mentioned, which were in the hospital a short time ago, will cite a few to prove a lack of infection.

Case 3. Greek, extra gang laborer, got lower third of leg caught between jack-knifing of two rails while unloading, fracturing both bones with diagonal fracture of the tibia. There was a gaping wound about one and one-fourth inches long, where the tibia came through the skin. It was set by the above mentioned method. He was six weeks on crutches, using leg to bear part of weight. Perfect result.

Case 4. Jap laborer, while working handling steel rails, has a leg caught between rails. He had a compound comminuted fracture which was set by split-cast method. He was using leg in eight weeks.

Case 5. Fifteen years ago a lady, 65 years old, was running a rooming and eating house for the Great Northern Railroad. Rear end of rooming house was between four and five feet from the ground and had no railing around it. While coming down stairway she slipped and fell, suffering a compound comminuted fracture just above the shoe top, both bones being driven through stockings, foot hanging off to side. Being called immediately, I found both tibia and fibula protruding about an inch, covered with dirt and parts of stocking. I everted the bone still more, scrubbed it thoroughly with lysol solution and brush.

Dilute lysol means just making the water soapy. I do not believe standardization can be made of a lysol solution any more than with soap in hard or alkaline water. One has to use sufficient lysol to overcome alkalinity of water. This gives a soapy solution which has a strong antiseptic value and is very cleansing.

I gave anesthetic, pulled bones back into place, dressed in bichlorid and alcohol pack, used split-cast, extending over about two-thirds of thigh above knee. At end of six weeks there was bony union with some stiffness of knee joint. At the end of eighth week, leg seemed perfectly firm. I put leg over knee, gave it a sudden bend, loosening the joint; from then on she had perfect motion.

Case 6. A young man nineteen years old, riding a motorcycle, came in collision with a large touring car. The tibia felt like an eggshell, little pieces of bone sticking all the way through the skin from ankle to the knee. We used heavy extension, put on split-cast. At end of three months he had practically a perfect leg, shortening about one-half an inch, slight stiffness in the ankle. Had some suppuration along the tibia, where we had to remove a few spiculae of bone.

Case 7. This case is cited to show the results of nonoperative procedure. A man, sixty years old, while driving on ferry with truck loaded with milk cans, was thrown off truck, falling under the rear wheels, smashing both legs. Was put in split-casts. At end of three months was strong fibrous union, but no bony union, due to age and shock from accident. He refused operation. We had laced braces made for his leg and put him on the beach. He used to take off the braces and rub the leg with hot sand. At the end of a year the legs became solid and he returned to his regular farm work.

Case 8. F. G., a logger, got leg between two logs, crushing leg, badly injuring soft parts—compound comminuted fracture. There was a question whether to amputate or not. Leg was put in split-cast after removing some bone of tibia which was loose. At the end of three months he had strong fibrous union, which seemed to grow stronger week by week. At the end of two years he was back doing his regular work as hook tender in logging camp, wearing no brace. Says his leg is perfect.

Case 9. Mrs. S., 65 years old. Her auto struck by train. She had compound fracture of finger which was nearly cut off; bolt driven into knee, fracturing knee cap and splitting the femur, breaking it off about three inches above the condyles. Using gloved finger, I removed pieces of bone. The leg was pulled down into place as well as possible. A light Buck's extension was used for twenty-four hours. Because of patient's age and condition, we did not like to put on tongs. However, we put on a split-cast and had her sit up as soon as possible. As the bones were not properly engaged, the lower fragment became subluxed, which could possibly have been prevented by using tongs. Cyanide pack dressing was used and the leg permitted to heal as it was. She was out of hospital in two months and gets around on crutches very well, although she has some motion of knee joint, which we wish were stiff. This is the only point from which she suffers.

It is now about one year from time of accident, and on account of her age we do not feel justified in ankylosing joint. We bring this point up to show that if there is no infection of joint surfaces, although they are contused, they will heal and still have motion.

Impacted fracture of the hip we get from collisions or in timber workers, due to heavy blows. We never disturb them. Put on spica cast, keep patient in bed and one always has good results. There may be some slight shortening and some stiffness but it is not painful or noticeable.

Intracapsular fracture of the hip, fracturing the head from neck within the capsule. We have had nine cases with eight good results. Our method of treatment is that described by Dr. Maxwell Ruth of Iowa about twenty years ago. It consists of tilting head of the bed downward on about nine-inch blocks, with a six-inch block on the side the fracture is on, tilting the patient to opposite side.

We apply Buck's extension with about fifteen or twenty pounds, using a T-splint to keep foot in proper alignment. In this the great toe is in line with middle of patella and anterior superior spine of ilium. This applies to all fractures of leg and must be observed to get results. We use counter-extension around thigh, over side of bed, with a pull of eight to ten pounds. The principle depends on the ligamentum teres holding head of bone in the acetabelum, the capsule and Y-ligament of Bigelow, held taut by extension over side of bed, acting as a splint which holds fractured parts in apposition. This permits patient to sit up to seat his meals, etc. As this fracture generally occurs in old people, this is very essential.

CONCLUSIONS

The use of the split-cast with proper extension keeps down infection by preventing motion and gives better results than most operative procedures.

The use of the laced supporting boot, with plenty of time and patience, will get union in the greater number of ununited fractures.

CALCIUM ABSORPTION FROM INTESTINAL TRACT IN HUMAN SUBJECTS. Bernard S. Kahn, Joseph H. Roe and A. S. Finkelstein, Washington, D. C. (*Journal A. M. A.*, June 5, 1926), show that calcium lactate administered orally to ten human subjects produced elveations of the blood calcium level as follows: Twenty gram doses gave an average maximum elevation of 81 per cent between the fourth and fifth hours following administration, and a sustained elevation above normal for approximately four hours. Five gram doses gave an average maximum elevation of 80 per cent between the sixth and seventh hours following ingestion, and maintained an elevation above normal for approximately nine hours. Two grams gave an average maximum elevation of 41 per cent at the sixth hour following ingestion and a sustained elevation above normal for one and one-half hours.

NORMAL AND ABNORMAL EPIPHYSES*

Carl E. Koenig, M.D.
SEATTLE, WASH.

There is considerable disparity in the opinion of medical writers as to the date of appearance and the time of union of the various epiphyses. Works on anatomy, histology, pediatrics and roentgenology indicate that the stages of development of the epiphyses in the normal growing child are not as yet thoroughly established. The nomenclature relative to epiphyses is also in an unsettled state.

The date of appearance of the centers of ossification within the epiphyseal cartilage, the transition of all of this cartilage into osseous tissue, and the final union of the epiphyses to the diaphysis are influenced and governed by environment, diet, state of health and the functional activity of the endocrine glands. The dates of the appearances of the deciduous and permanent teeth are also influenced by these factors, but in the case of teeth the stages of development are definitely established. There is little disparity in the writings of the authors and the normal standard has apparently been found.

It is obvious why there is agreement of opinion as to the date of the first appearance of teeth. It is only natural that it should be so, for observations on erupting teeth have been made by direct inspection covering a period of time since the study of medicine and dentistry was first inaugurated. The epiphyses, on the other hand, are not visible to the naked eye and the more laborious method of examination by means of dissection has for this reason brought these parts under investigation much less frequently. A new method, however, has come into use which has added very materially to the data that have accumulated. This is by means of the roentgen ray.

The radiograph has helped a great deal in arriving at a definite descriptive standard. It has been used by men in the different specialties in their investigations upon normal and pathologic epiphyses. Rotch, the pediatrician, and Hickey and Baetjer, radiologists, did considerable research work along this line many years ago, and more recently Isidore Cohn has written a valuable monograph, entitled "Normal Bones and Joints," which has gone a long way toward establishing what is to be found in the joint of a normal child, including the epiphyses.

Engelbach, the endocrinologist, has apparently gone a step farther by taking into consideration the influence of the endocrine glands upon bony tissue, when making a radiographic study of the epiphyses. His article in association with McMahon, found in the January, 1924, number of *The Journal of Endocrinology,* is deserving of extensive study. It tells of the appearances of the epiphyses in the normal and the abnormal child, and it would appear that it is a work that will often be referred to as a standard by which we may be guided.

A large series of cases both normal and abnormal were radiographed, and in the study of these cases very valuable conclusions were drawn from the comparisons of the normal with the abnormal. It was also pointed out that there are variations of from two to four years in the classifications of the various authors regarding the time of appearance and also of union of certain epiphyses.

Baetjer, the roentgenologist, Rotch, the pediatrician, and Gray the anatomist, differ widely in their written opinions. Engelbach believes that some of these discrepancies could be explained by the possibility that the roentgenologists, the pediatricians, and the anatomists have not taken the endocrine functions into consideration when examinations of their cases were being made. He says, "the fact that endocrine possibilities had not been taken into consideration might explain the marked variability in age of the appearance of the centers of ossification and the fusion of the epiphyseal lines, as well as the general variations in the growth of various bones."

Engelbach's observations have been very extensive. They cover a series of over 2,000 cases and, as the clinical examinations were so complete, his classification specifying the time of appearance and union of bone centers in normal children and young adults is especially significant. "The clinical examination," in his series of cases, "consisted of investigating the family history particularly for endocrine and hereditary conditions, including blood examinations of the parents. A complete medical survey of each individual was made, including comparison for the height, weight, and age, and age with the normal (established by tables by Browning, Bowditch and Holt for infants and children, and insurance tables for adults). Provided the individual was considered normal according to these qualifications (i.e. family history, personal history, physical examination and the standard tables just now mentioned), he was then radiographed and the x-ray findings were compared with those for the various ages, as given by Gray's Anatomy and the radiologic studies of Baetjer and Waters, Knox, and Rotch. Normals were examined eight to ten days after birth, at six months, one year, eighteen months, two years, and for each year up to the age of twenty-five. A number of each age were examined until enough were found without physical or roentgenologic variations from the normal to establish a standard." This work presented a great many difficulties and required a long time in order to exclude the abnormals physically, and then finally to determine the roentgenologic normal.

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*Read before the Specialists' Section of King County Medical Society, Seattle, Wash., Sept. 28, 1925.

In view of the fact that Engelbach's investigations are so comprehensive and complete his classification of the normal time of appearance and union of the various epiphyses should be regarded as a safe standard to be guided by. It is found to be as follows:

APPEARANCE AND UNION OF BONE CENTERS

(Engelbach and McMahon)

- 1st Year—
  - Coracoid process scapula
  - Head of humerus (6-7 months)
  - Capitate and hamate (os magnum and unciform)
  - Head of femur
  - Upper epiphysis tibia (birth)
  - Third cuneiform
- 2nd Year—
  - Greater tubercle humerus
  - Capitellum, humerus
  - Lower epiphysis radius
  - Patella (2-3 years)
  - Lower epiphysis tibia
  - Lower epiphysis fibula
  - First and second cuneiforms (2-4 years)
- 3rd Year—
  - Os triangularis (carpal cuneiform)
  - Heads of metacarpals
  - Heads of phalanges
  - Heads of metatarsals (3-7 years)
- 4th Year—
  - Lunate (semilunar)
  - Greater trochanter femur
  - Upper epiphysis fibula (3-4 years)
  - Navicular (tarsal)
- 5th-6th Year—
  - Union of head and tubercles humerus
  - Medial epicondyle humerus (internal condyle)
  - Upper epiphysis radius
  - Greater multangular (trapezium)
  - Lesser multangular (6-8 years) (trapezoid)
  - Navicular (carpal) (5-6 years)
- 7th Year—
  - Lower epiphysis ulna
  - Union of ischium and pubis
  - Epiphysis os calcis (7-9 years)
- 9th Year—
  - Pisiform (9-11 years)
- 10th Year—
  - Olecranon, ulna
  - Trochlea, humerus
- 11th Year—
  - Lateral epicondyle humerus (11-12 years)
- 13th Year—
  - Lesser trochanter femur
- 14th Year—
  - Union of heads of metacarpals (14-15 years)
- 15th Year—
  - A. of acromion
  - Inferior angle scapula
  - Union of centers of scapula (15-18 years)
  - A. of sternal end clavicle (15-17 years)
  - Union of heads of phalanges, hand
  - A. of secondary centers os coxae
    - A. Crest of ilium (15-18 years)
    - B. Acetabulum (15-16 years)
  - Union of primary centers os coxae
- 16th Year—
  - Union of:
    - Distal extremity humerus
    - Olecranon, ulna
    - Upper epiphysis radius
    - Heads of metatarsals
    - Heads of phalanges, feet
- 17th Year—
  - Union of:
    - Lower epiphysis radius
    - Lesser trochanter femur
- 18th Year—
  - Union of:
    - Head of humerus
    - Head of femur
    - Greater trochanter femur
    - Lower epiphysis tibia
- 18th-20th Year—
  - Union of:
    - Lower epiphysis ulna
    - Secondary centers os coxae (20-25 years)
    - Lower epiphysis femur
    - Upper epiphysis tibia
    - Lower epiphysis fibula
    - Upper epiphysis fibula
- 22nd-25th Year—
  - Union of sternal end clavicle

The older terminology of the carpal bones has been inserted, as many doctors are accustomed to these names instead of the ones mentioned.

The following rules regarding bony union of epiphyses and diaphyses have been laid down by Gerrish:

"1. The extremity whose ossific centre is the first to appear is the last to unite with the shaft. Exception, the lower end of the fibula, probably because the upper end is vestigial.

"2. The extremity toward which runs the nutrient artery is the first to unite.

"3. The nutrient arteries run toward the elbow and away from the knee, i.e., down hill, if elbow and knee are both flexed.

"4. Union of the epiphyses and diaphyses of long bones occurs from the sixteenth to the twenty-second year (occasionally twenty-fifth year, tibia) and earlier in the upper than in the lower extremity.

"5. When two or more centres of ossification occur in an epiphysis, these unite together before the epiphysis unites with the diaphysis or shaft."

Baetjer makes a very interesting observation regarding the metacarpal bones of the hand. He says, "The thumb metacarpal has its epiphysis at the proximal end, while the remaining four have their epiphyses at the distal end. This, taken into consideration with the fact that all the phalanges have their epiphyses at the proximal end and that the thumb has only two phalanges, suggests that the thumb metacarpal is in reality a phalanx."

The great toe, which is the counterpart in the foot of the thumb in the hand, has a similar arrangement of the epiphyses, i.e., the epiphyses are all found at the proximal ends of diaphyses.

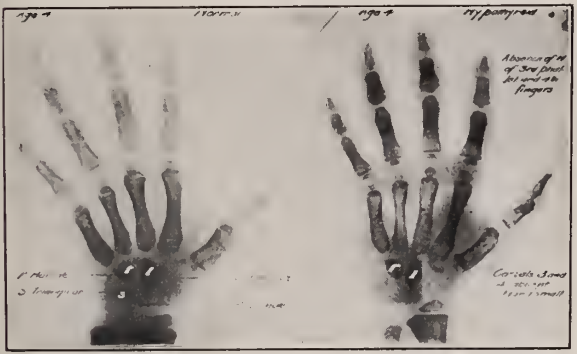


Fig. 1. Comparison of normal (left) with hypothyroid (right), aged 4. Note the presence of the capitate, hamate, os triangularis and os lunatum in the normal, also heads of all metacarpals and phalanges. Note the presence of only two carpal bones, capitate and hamate, and the absence of some of the heads of the metacarpals and phalanges. The hypothyroid has the osseous development of a normal, aged 2. (By courtesy Dr. Engelbach.)

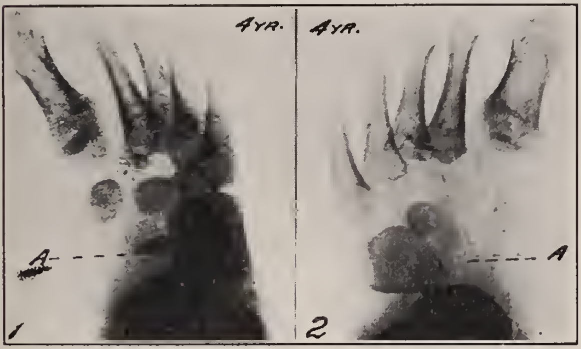


Fig. 2. 1. Normal, aged 4. A, Presence of navicular. 2. Hypothyroid, aged 4. A, Absence of navicular. Absence of second cuneiform, with underdevelopment of all tarsals. (By courtesy Dr. Engelbach.)

A study of Engelbach's findings regarding abnormal development, exemplified by retarded or premature appearance and union of the various epiphyses, is intensely interesting and a brief review will be made of some of his abnormal cases.

He cites a case of hypothyroidism, age twenty-six months, which showed in the x-ray examination only one carpal bone, the os magnum. The unciform and the lower epiphysis of the radius were found to be absent when compared with the wrist of a normal child.

He described a hypothyroid hand in a case aged four years. The normal hand at this age should show four carpal bones, the os magnum, the unciform, the cuneiform and the semilunar, and the heads of the metacarpals and phalanges should be well developed. The hypothyroid hand showed an absence of the cuneiform and the semilunar. The heads of metacarpals and phalanges were underdeveloped and in some instances were absent (fig. 1). Engelbach says, "The delayed development of carpals is an outstanding feature in hypothyroid cases, although rather constant delayed development in the epiphyses of the other long bones has been found." He also has given an illustration of a hypothyroid foot, in which the navicular and second cuneiform were absent at the age of four (fig. 2).

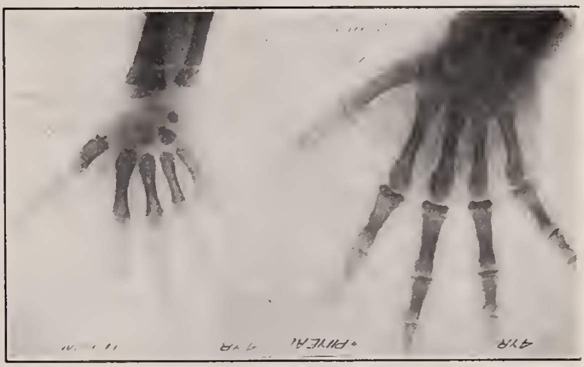


Fig. 3. Comparison of a suspect hyperpinealism (left) with a normal (right), aged 4. Note the overdevelopment and massing of all the carpal bones, closure of all epiphyseal ends of the metacarpals and phalanges, and development of the epiphyses of the radius and ulna in the hyperpineal case. The entire hand is very much larger and the osseous development is esual to the age of 12 in the hyperpineal. (By courtesy Dr. Engelbach.)

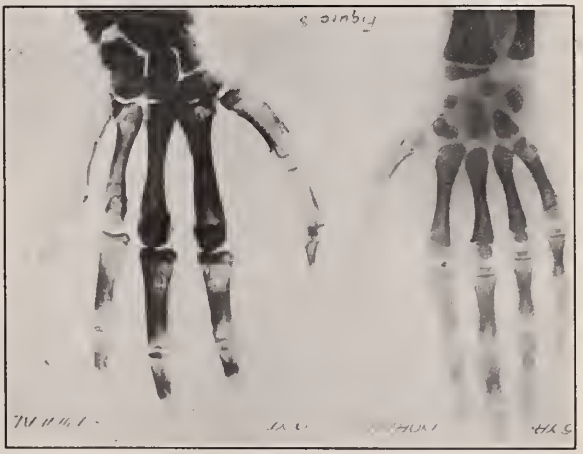


Fig. 4. Comparison of a suspect hyperpineal (right) with a normal (left), aged 6. Same osseous development as in figure 3 with the exception that it is more advanced. (By courtesy Dr. Engelbach.)

In a case of suspected hyperpinealism a hand of a child aged four years was found to have a bony development equivalent to that of a normal child twelve years of age (fig. 3). Another similar case, age six (fig. 4), had a bony development of the hand, corresponding to a child fourteen years of age. So it is seen that we may have an advanced stage as well as a retarded stage of development in cases of endocrine disorders.

He also gives a description of the radiographic findings in hypogonad subjects and other types of endocrine deficiencies, such as cases of enlarged thymus gland and of acromegaly. These descriptions are very interesting from the standpoint of epiphyseal and bone abnormalities, but the conditions already cited are sufficient to emphasize the significance of the part played by endocrine secretions in the development of bones and epiphyses. So I will not discuss this aspect of the subject any farther.

I wish now to touch upon another phase, namely, injury to the epiphyses. But before doing so let me briefly review the histology of the normal epiphysis.

In the early stages of development an epiphysis is composed entirely of cartilaginous tissue. With the exception of the epiphysis of the lower end of the femur and the upper end of the tibia, they are all cartilaginous at birth. A little later in the stage of development one or several centers of ossification appear within this mass of cartilage. These coalesce, when there are several, and enlarge until all of the cartilage tissue is converted into bone. It is then a fully developed epiphysis, and as a final step in development it becomes united to its diaphysis. When union is complete, it is no longer an epiphysis but instead is a part of the parent bone.

When one considers the stages of development of the epiphyseal tissues, first, in the infant when the structures are entirely cartilaginous; second, in adolescence when the epiphysis is partially made up of cartilage and partially of bony tissue with the bony epiphysis separated from its corresponding shaft by the epiphyseal line; and, third, in adult life when the fully developed epiphyses have become permanently united to the diaphyses, it is readily seen what is most likely to occur when a joint is subjected to severe acute bending or torsion.

In the first instance, that is infancy, as has already been stated, the tissues at the ends of bone are entirely cartilaginous. This cartilaginous tissue is very flexible and capable of much bending and torsion. It is only in the extreme and exceptional case that we have any separation of cartilaginous epiphyses durng this stage and rarely a fracture, or more correctly speaking a rupture, through this soft cartilaginous tissue. However, in adolescence, when the bony epiphyses and their corresponding diaphyses are separated merely by a narrow zone of cartilage known as the epiphyseal line, an entirely different condition prevails. These structures are then chiefly of a bony nature, but some cartilaginous tissue still exists in the space between the epiphysis and the diaphysis. This is a point extremely weak in comparison with the structures on either side and very naturally separation at this juncture occurs easily. It is a natural line of cleavage, especially in the few months immediately before and directly after union of the epiphysis to the diaphysis.

In the adult stage there is complete union and merely a vestige of the epiphyseal line remains, or it is entirely absent. We now have a fully developed bone, and the possibilities of epiphyseal separation are not to be considered. When we study the epiphyses in the light of these three stages, it is readily understood why epiphyseal separation occurs so frequently in adolescence, rarely in infancy and never in adult life.

At this point I wish to say something regarding the nomenclature of epiphyseal structures. There is considerable discrepancy in the use of the terms epiphyses and epiphyseal line. We have learned that in the early years of life the epiphysis is partially bone and partially cartilage. As the cartilaginous portion is not seen upon the x-ray plate, the roentgenologist is apt to think only of the bony portion when making his interpretations, as is indicated in his writings upon the subject. There are others writers who speak of an epiphyseal line when the width of cartilage between the bony epiphysis and its diaphysis is as wide as it is long, and no line can be said to have much in dimension except length. For this reason the term, "epiphyseal line," when used in this manner, is a misnomer. The best example of an epiphyseal line is seen just before the epiphysis is about to unite and immediately after its union to the diaphysis. The line can be said to be in evidence for only a few years before and after union.

Greater care should be given to classifying the epiphyseal structures. It might be well to adhere to the terms—epiphysis, epiphyseal cartilage, and epiphyseal line, or another classification of bony epiphysis, cartilaginous epiphysis and epiphyseal line might be considered, each term designating distinct entities. In any event some agreement should be arrived at to avoid much of the confusion that now exists.

There has been considerable controversy also as to the term epiphyseal separation, some contending that, as a portion of the diaphyseal bone is so frequently broken off with the epiphyses, it should be called a fracture. Much can be said in favor of either side of the argument but in the treatment of such a case the thing mainly to be considered is that it is a break in continuity of the epiphysis from the diaphysis. Separations or breaks of this character, especially in and about the elbow joint, should be diagnosed and treated very early, as swelling of the soft parts interferes with reduction and subsequent treatment.

Cohn has devised some very valuable roentgenologic signs that assist in determining whether the epiphyses at the elbow hold the proper relationships to the diaphyses. He is quoted as follows:

"A plane passed through the middle of the long axis of the shaft of the humerus in a lateral view, prior to about the ninth year, passes behind the posterior border of the capitellum; after this period the plane bisecting the shaft of the humerus has approximately two-thirds of the lower epiphyses anterior to it.

"The plane of the anterior limit of the shaft of an adult humerus shows at least one-half of the capitellum anterior to it in a lateral view of an x-ray plate.

"A plane at right angles to the base of the capitellum and bisecting it intersects the plane through the middle of the long axis of the shaft at an angle of about 130 degrees in a lateral view of an x-ray plate.

"When the forearm is extended on the arm and supinated, a plane passed through the middle of the long axis of the humerus is intersected by a plane through the middle of the long axis of the ulna at an angle of approximately 170 degrees in an anteroposterior view of an x-ray plate."

When one is guided by standards of the normal time of appearance and of union of the epiphyses, normal relationships will be recognized when no injury exists and, on the other hand, correct diagnosis of separations and fractures will be made much more frequently.

Cohn's lines in determining the existence of separation and fracture prove to be highly valuable. This method of examination appears to be an innovation in the radiographic findings of separation of the epiphyses, and should prove to be quite as valuable as the use of Bryant's triangle and Nelaton's line in the determination of intracapsular fracture of the hip.

SUMMARY

1. In summing up the material in this paper it can be pointed out why there are discrepancies in the classifications as to the time of appearances and the time of union of the various epiphyses.

2. Engelbach is convinced that confusion as to the normal time of appearance and the normal time of union of the epiphyses is due in great measure to the fact that influence of endocrine secretions upon development of bony structure has not been considered.

He also states that the lack of functional activity of the endocrine glands influences the growth of epiphyses very markedly. Certain cases are offered in substantiation of this theory. It is evident that we are crossing the threshold of new discoveries as regards the epiphyses in their relation to health, injury and disease.

3. The importance of ruling out the possibility of epiphyseal separation in injury to the joints of adolescent children should be more thoroughly understood. A diagnosis of fracture or dislocation in children of this age should not be made without first ruling out the possibility of separation. In the adolescent age epiphyseal separation should be the first consideration.

4. Cohn, in his textbook, "Normal Bones and Joints," gives us some very valuable information how to diagnose injury to epiphyses at the elbow joint.

5. And, finally, may we use every means at hand in arriving at correct diagnoses of abnormal and injured epiphyses.

DIABETIC COMA AND INSULIN. The difference in mortality before the discovery of insulin and since that time, with especial reference to diabetic coma, was made the subject of study by Lwis Fox Russell and Joseph Hajek, New York (*Journal A. M. A.*, June 19, 1926). Two hundred and seventy-six cases of diabetes were analyzed. These cases fell into two groups—preinsulin and postinsulin. In the first group were 113 cases. Of this number, twelve patients were treated surgically. Of the 101 patients treated medically, eighteen patients died, a mortality of 18 per cent. Diabetic coma was responsible for twelve of the eighteen deaths. In the remaining six cases, the imediate cause of death was due to other diseases than diabetes, leaving a mortality of 12 per cent due directly to diabetic coma. Of the twelve patients treated in the surgical division, four died, a 33 per cent mortality, though none died in diabetic coma. In the second group were 163 patients. In the medical service, of the 134 treated, thirteen died, giving a total mortality of 9.7 per cent. Only one among these died in coma, a mortality from coma of 0.7 per cent. The surgical service cared for twenty-nine cases, resulting in seven deaths, none being due to coma.

BONE SARCOMA

Harold W. Stone, M.D.
BOISE, IDA.

Recent work on the pathology and classification of bone tumors has changed many of our previous concepts relating to their treatment and at the same time enables us to offer a more accurate prognosis. The work in the "Registry of Bone Sarcoma," by Ewing, Codman and Bloodgood, is invaluable and we are indebted to them for a much simpler and more rational classification. A very brief review of the literature on this subject will emphasize the confusion of the present terminology. Many of the statistics are valueless because of this confusion and the report of cures is correspondingly misleading. A review of our cases for the past three years shows three cases for which the records are fairly complete, including history, pathology, operative notes and satisfactory x-ray pictures.

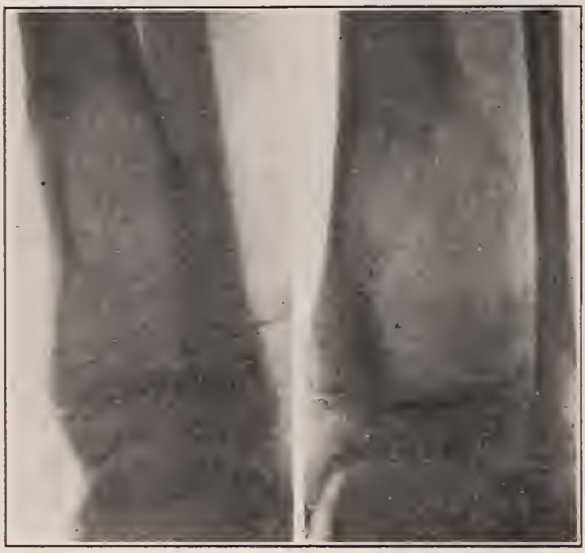


Fig. 1, Case 1. Illustrating expansion of bone and intact cortex.

Case I. Seen in Sept., 1923. Female, age 12 years, giving the following history: Between four and five months ago noticed a pain in left ankle. Is not aware of any antecedent injury. This pain was worse when up and about and was relieved by lying or elevating foot. The pain has gradually increased in intensity and noticed a swelling above left ankle, which has grown slowly since first noticed six weeks ago. For the past month has been up and about on crutches or in wheel chair.

Examination showed a normally developed and healthy girl. A smooth firm fusiform swelling was noted above left ankle without redness or superficial tenderness of any degree. There was considerable pain on deep pressure (fig. 1).

At operation (St. Luke's Hospital) a cavity was found at the diaphyseal end of left tibia. This cavity was filled with old blood and granulomatous material. The cavity was thoroughly curretted and 50 mg. of radium left in the cavity for twelve hours. No recurrence noted up to the present time.

A report of giant cell sarcoma was made by the pathologist (fig. 5).

Case 2. Seen in August, 1924. Boy, 16 years old, eight or nine years ago was kicked on left shin by a playmate. Skin was unbroken and no considerable pain resulted but he limped some and about a week later a bunch appeared which increased slowly in size until about six months ago, when he was hit in the same spot by a lump of coal thrown by another playmate. He had a good deal of pain following this second injury and was in bed several weeks. For the past month he has been up and about on a cane or crutches.

Examination shows a normally developed boy, save for a fusiform swelling of upper tibia, giving it a bowed appearance. Moderate tenderness on deep pressure. A diagnosis of benign cystic tumor was made. At operation the following day an intact bony shell was found, surrounding a firm sausage-shaped tumor 4 inches by ½ inch (fig. 2). Attempt at limitation was evident but areas were found in which bone was being rarefied. The tumor was growing up and down the medullary cavity, limited somewhat by the epiphysis. The enucleation of the tumor was followed by a thorough currettage of the cavity.

The history and x-ray findings in this case suggested a diagnosis of a benign condition. The findings at operation introduced the possibility of malignancy. A section was mailed to the Registry. Dr. Ewing expressed a doubt as to whether the condition were much more than a productive osteitis. Dr. Codman placed it as a border line condition between inflammation and new growth, advising resection in the event of recurrence. Dr. Hartwell and Wright of the Massachusetts General Hospital regarded it as an osteitis-fibrosa and as a low grade osteogenic sarcoma respectively.

Eight months following and in spite of two courses of x-ray therapy, the patient returned with a definite recurrence at junction of upper and middle third. At operation done by Dr. J. L. Stewart a section of tibia was removed and a graft used from opposite tibia as shown in plate (fig. 2). No recurrence has been noted to date.

Case 3. Girl, age 16. Seen in May, 1925. Patient had been taken directly to St. Alphonsus Hospital on

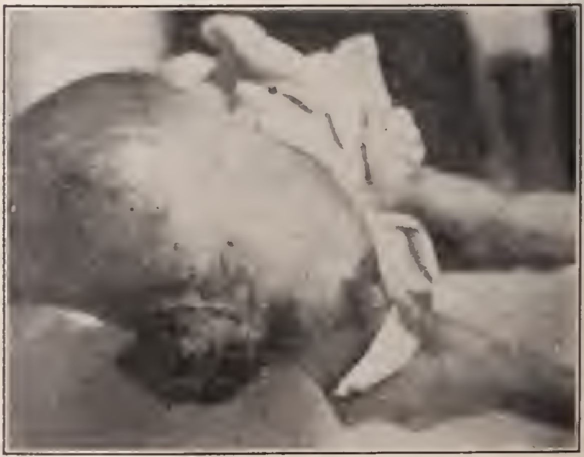


Fig. 3, Case 3. Photograph of gross specimen.

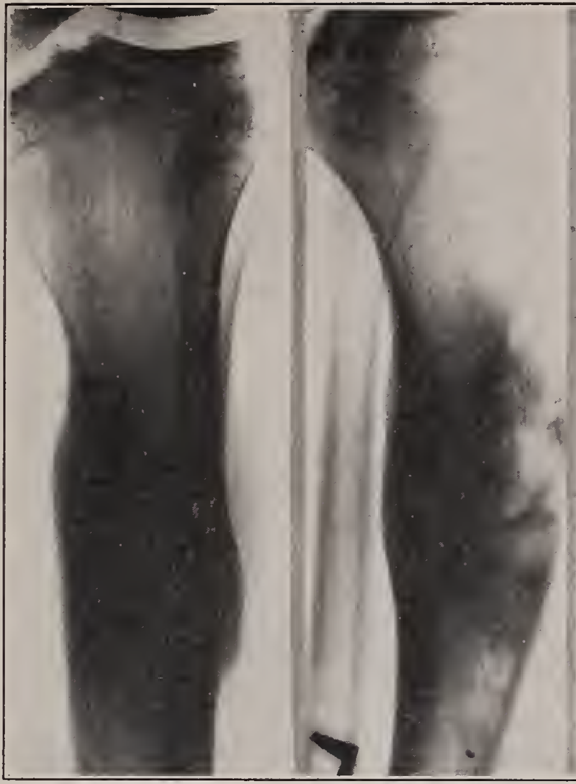
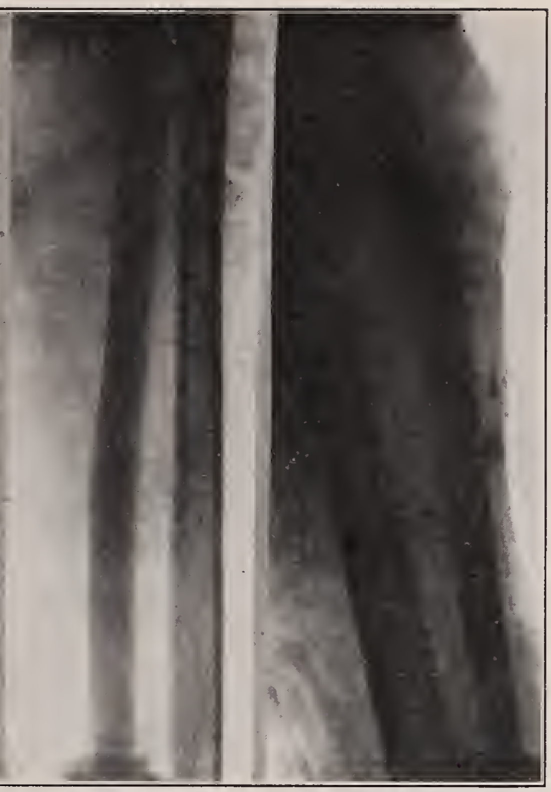


Fig. 2, Case 2. Shows bowing and trabeculation suggestive of Paget's disease.



X-ray following operation to show amount of bone resected.

account of pain, disability and a large sloughing ulcerated wound on left knee.

About six months prior to admission a history of a sprain is obtained. This sprain was not severe and patient continued up and about although a slight limp developed. About two months later she bumped same knee against edge of the table. A slight black and blue spot appeared and the pain and limp became more noticeable. About this time a swelling appeared above the knee and several doctors were consulted. An incision was finally made in the joint to relieve the effusion present and a section of tissue given to a pathologist who returned a diagnosis of a benign inflammatory condition. Cultures from the knee were reported sterile.

On admission the patient appeared toxic and was running irregular temperature. The blood count showed a well marked leucocytosis and secondary anemia. The appearance of the knee is shown best by the photograph (fig. 3). A high femoral amputation was advised and performed on the following day. An enlarged femoral gland was removed. Sections of the tumor sent to the Registry proved to be definite osteogenic sarcoma. Sectio nof the gland did not reveal any save inflammatory changes.

The patient made an uneventful recovery and has completed two courses of deep therapy. No recurrence is evident.

Case 4. Male, age 21, noticed a pain in the left leg above the knee sometime in August, 1925. There is no history whatsoever of any injury. Shortly after the appearance of the pain a small lump was noticed on the head of the left fibula. This was not particularly tender at the time save on deep pressure, but

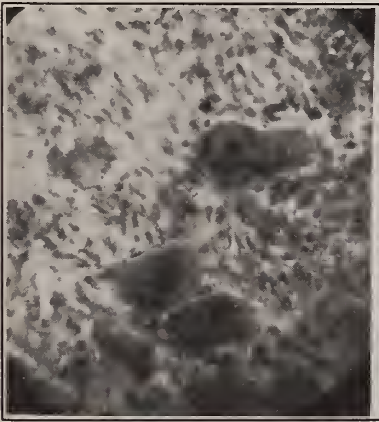


Fig. 5. Case 1. Microscopic section, showing giant cells.

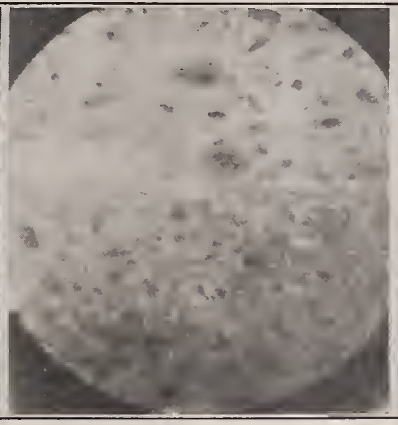


Fig. 6, Case 2. Microscopic section of tumor.

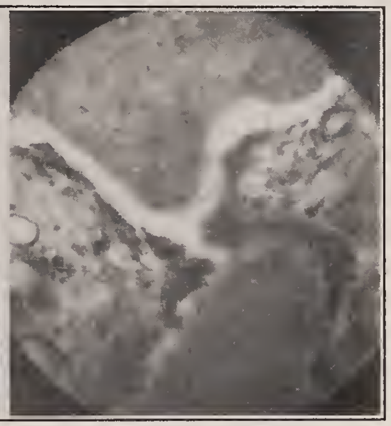


Fig. 7. Case 3. Microscopic section, showing osteogenic sarcoma.

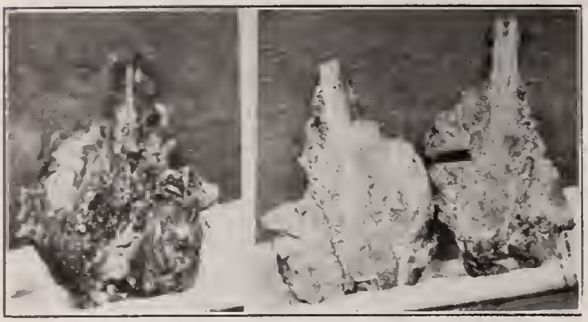


Fig. 4, Case 4. Photograph of gross specimen.

it has continued to grow in size and sensitiveness. He developed a limp shortly after the onset but continued at hard work until November. For the two or three weeks prior to admission at the hospital he had been unable to work and has had to go around on crutches.

The examination is essentially negative, save that it reveals a firm fusiform swelling involving the head of the left fibula (fig. 4). The skin is adherent and reddened; moderate tenderness on firm pressure. The joint motion was not limited.

Photographs of the tumor seem particularly typical of this type of growth, showing the striae radiating from the bone and at right angles to it. There also was an erosion of the cortex and an apparent involvement of the tibia. The joint space is free of any involvement.

Amputation was done on the following day, six inches above the knee. The tibia was not involved and the cartilage is shown to have acted as a barrier to the extension of the growth.

ETIOLOGY

There is general agreemnt among most writers that trauma is a factor in the large majority of bone tumor cases, both of the benign and malignant types. Meyerding[1] considers the single hard injury to be the kind most frequently followed by sarcoma. Its usual location at the diaphyseal extremities of the long bones, particularly the knee, gives some support to this theory, although Ewing[2] cites this fact in support of the supposition that an abnormal blood supply, resulting in an overabundant nutrition of the part, causes an alteration in the rate and form of growth which then may take on malignant characteristics.

Rhodes[3] reports three cases of periosteal sarcoma, in which he found an associated osteomyelitis. In two of these cases there was evidence that the osteomyelitis preceded the tumor. Foster[4] reports a case of probable periosteal osteoma, following a slight cut in the lower part of the humerus, resulting from the incision of an abscess. The tumor appeared within three months of the injury. Attention has been called to the possible importance of these considerations in workmen's compensation cases.

The symptoms of bone tumor are fairly characteristic. A history of injury of a long bone near a joint, followed in a few days or weeks by a persistent, slight and deep-seated pain, should suggest this possibility, particularly in a person under twenty. Severe pain is not a constant feature nor is it of great diagnostic importance. The benign giant cell tumor, expanding the cortex or encroaching on a joint space, may produce severe pain, while the extremely malignant osteogenic sarcoma as in case 3 may have very little pain.

The pain in the three cases reported was not a striking feature. Case 1 had had pain for several weeks before any limp or disability was noticeable. Case 2 had very little or no pain over the several years in which a tumor was known to be present, save following the last injury which caused a fracture of a portion of the already thinned cortex. The more rapid development of the tumor subsequent to this injury did not result in any increasing pain. Case 3 had some pain from the onset with slight disability, but she was not taken to a doctor for several weeks and then chiefly because of the swelling and limp. This is an entirely different picture from that resulting from an acute osteomyelitis, an acute arthritis or tuberculous arthritis.

Tenderness does not appear to be marked in most cases. Swelling when it does appear may be the result of the actual tumor growth or secondary to it as a joint effusion. In neither event should it be confused with infectious joint or bone conditions.

The general condition, pulse rate, blood examination, etc. show little change in early stages. Disuse atrophy, such as occurs early in the acutely painful conditions, is not present or is seen late. The relatively late appearance of any severe pain or noticeable tumor makes an early diagnosis the exception.

DIAGNOSIS

An accurate history is important and in no other condition is there greater necessity of an intelligent relation of the symptoms complained of with the physical findings. Clear x-ray films are essential and one that does not show good bone detail should be discarded.

Most solitary growths limited to the medulla are benign. The various bone cysts and related giant cell tumors are necessarily medullary. These tumors occupy the diaphyseal extremities. The portion of bone involved is expanded but an intact cortex is the rule. The neighboring joint may be encroached upon, producing some degree of joint pain and disability but the joint cartilage is not involved.

This type of neoplasm shows no new bone formation. Its incidence is typically between the ages of fifteen and thirty years. The rate of growth is slow.

Osteogenic sarcomata occur most frequently before maturity. Their origin may be either medullary or cortical and they usually originate at the diaphyseal extremities. Their rate of growth is rapid according to the degree of their malignancy. If of medullary origin, the cortex is broken through early. If of periosteal origin, there is less evidence of bone involvement but the new bone formation suggests an osteogenic tumor, particularly when seen perpendicular to the shaft, the "sunset" appearance. The greater the amount of new bone formation, the less the degree of malignancy. Here, as in the benign type, the cartilage is rarely involved.

Morton and Duffy[5] speak of the great difficulties in making a diagnosis. They emphasize the need for a proper approach and outline three methods of study: (1) The clinical course with the known age incidence of the various kinds of bone tumors. The location in the bone and the rate of growth. (2) Correctly interpreted roentgenograms. (3) Microscopic study.

Regarding the excision of tissue for study there is some difference of opinion. Meyerding and Ashurst[6] believe it to be justified and even essential, Ewing, on the contrary, being of the opinion that the diagnosis of bone tumors from a small section is of doubtful value and not without danger to the patient, the clinical history and roentgenograms being the essentials in a diagnosis. He further observes that, if the diagnosis be approached more radically, the treatment might be much less radical.

There are many cases of border-line tumor such as case 2, in which no reasonable amount of tissue study can be expected to help much towards a diagnosis or prognosis. Careful note of the progress of such cases, particularly their response to conservative surgery and radiotherapy, will have to be depended upon.

PROGNOSIS

The presence of demonstrable metatases precludes any reasonable hope of a cure. Therefore, the chest should be x-rayed routinely before any treatment is begun or prognosis offered. The prognosis is frankly bad in all common types of malignant bone tumors. Codman,[7] in the "Registry of Bone Sarcoma," states that they have knowledge of only four cases of true (osteogenic) sarcoma which are alive in this country today who were treated over five years ago. Bloodgood, according to Codman, knows of only one similar case in his community and Ewing, according to the same authority, cannot produce evidence of a single five year cure not open to question.

TREATMENT

The treatment may be surgical or by radiation combined with surgery. The five cases cited by Codman were treated by amputation alone. Coley,[8] reviewing 118 cases of sarcoma of clavicle (giant cell?), including sixteen observed personally, concludes that the operation of choice is total excision, followed by the use of the combined toxins of B. erysipelas and prodigeosus (Coley serum) and radiation. The use of the serum he believes should be persisted in for six months. Ewing has found radiation "unsatisfactory but encouraging." Its effect depends a good deal on the type of tumor cell and the presence or absence of much intercellular stroma. A tourniquet or Esmarch bandage should be used in operating on all types of bone tumors unless clearly benign.

The treatment of bone cysts or the giant cell tumor is much more hopeful. Bloodgood[9] believes a thorough currettage is usually sufficient in giant cell tumor. He states that in his experience a central bone lesion, presenting an intact bone shell resembling a giant cell tumor in the gross and approximating its appearance microscopically, has always remained free of metastases. There is some evidence, however, that a change in the character of this type of tumor is possible, particularly following trauma.

Stone and Ewing[10] report a case of giant cell tumor, in which such a transformation resulted from repeated currettage and irradiation, death ensuing finally from lung metastases. Turner and Waugh[11] also report a case in detail, where a giant cell tumor of epulis type, involving the femur, developed a definite metastasis in the femoral vein following amputation. Pulmonary metastases and death followed within six months of onset. In our second case the evidence suggests a drift from a distinctly benign condition to one which, doubtful pathologically and clinically, shows malignant characteristics. This change followed a definite trauma, as noted before.

There is general agreement that radiation is relatively effective in this type of tumor. From a series of giant cell tumor, in which radiation was used either primarily or secondarily to follow up currettage or for recurrence, Herendeen[12] concludes that this agency can be relied upon to produce growth restraint, firm encapsulation of the tumor and relief from pain in the majority of cases. He further states that treatment by radiation is followed by a reaction which stimulates rapid tumor growth both clinically and roentgenologically. Isolated cases of spontaneous cure have been reported.

Giant cell tumors appear particularly prone to infection. The intramedullary application of radium is somewhat dangerous on this account, nor does it appear to be any more effective than external radiation. Currettage would appear to be indicated for the primary condition. Local excision with radiation appears logical for recurrence. Amputation should be reserved for obviously malignant conditions and then should be looked on as being more of a paliative than a curative measure. Ewing urges the use of radiation as a therapeutic test and Palmer[13] states that the roentgen ray should be used at the earliest possible moment, regardless of the pathology, providing osteomyelitis can be ruled out.

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Experience With Cholecystography in Cases Coming to Operation. C. C. McCoy and R. S. Graham, Cleveland (*Journal A. M. A.*, June 19, 1926), have used sodium tetraiodophenolphthalein in twenty-six cases. The cholecystographic diagnosis failed of confirmation in only one case, and in it the findings were somewhat equivocal. This gives a diagnostic pathologic examination.

BRODIE'S ABSCESS

REPORT OF TWO CASES

R. A. Quigley, B.S., M.D.
EVERETT, WASH.

Chronic infection in the cancellous tissue at the extremity of the long bones, manifesting itself as a definitely localized pyogenic abscess, without sequestrum and usually without external fistula, was first described in the literature by Sir Benjamin Brodie in 1845, and for this reason is commonly known as Brodie's abscess. It is a distinct pathologic entity, of established etiology, with characteristic symptom and with characteristic x-ray findings.

McWilliams[1] states that at the Presbyterian Hospital, New York, during seven years (1913-1920) there were one hundred fifteen cases of chronic suppurative osteomyelitis of the long bones and that among these there were but three cases of undoubted Brodie's abscess. The literature on this subject is quite limited. It is usually grouped under chronic suppurative osteomyelitis, so that one must wade through the voluminous material on this large subject to find Brodie's abscess.

The abscess is the result of an infection with organisms of low virulence, invariably dating back to a primary osteomyeltis, occurring in youth. The abscess cavity may persist for years without symptoms, the dormant infecting organisms walled off by dense bone or, following local injury or lowered general resistance, the process may again become active. It must be differentiated from syphilis of the bone, sarcoma, carcinoma, osteoma, bone cyst, chronic sclerosing osteomyelitis and arthritis.

Brodie's description of chronic bone abscess is classical and, because of the accuracy of the observations, should be of exceptional interest to both student and practitioner. This original report was published in the London Medical Gazette, in 1845.

I wish to present two cases which have come under my observation.

Case 1. The patient, a Norwegian mill-worker, age 53, was admitted to the hospital on Jan. 14, 1924, complaining of pain of varying intensity in the lower left leg.

The present trouble began forty-two years ago. The patient stated that at the age of eleven he suffered a "sprain" of the left ankle and that, following the injury, the lower lég became painful and swollen. The injury was treated by firing (multiple small cauterizations with a hot iron), this being the usual treatment for any local inflammations which persisted for a long period of time.

The patient's memory of the sequence of events at the time of this first injury is not clear. He states definitely, however, that he was in bed for seven months and that during this period there was a discharge from a wound above the ankle. No operation was performed and the wound finally closed. There has been no discharge since. The motion in the ankle has always been good. There has been pain in the lower leg after prolonged exertion, but at no time of sufficient severity to interfere with sleep or to cause him to stop work until the onset of the present illness.

On April 18, 1923, the patient's left ankle was caught between two timbers, the resulting injury causing some pain with swelling of the joint, which was relieved by hot applications. The pain subsided but recurred in about a week, gradually increasing in severity, and on May 3 he was forced to discontinue his work. He stated that elevation of the leg relieved the pain but that it was impossible to bear his weight upon the affected limb.

The patient was a vigorous, well nourished man. The body, except face, presented large patches of psoriasis. General physical examination otherwise negative except for left ankle.

From below ankle to middle of lower leg were many pigmented scars uniform in size, 1 cm. x ⅓ cm. evenly distributed (old burns), with a larger scar 3 cm. x 2 cm. just above internal malleolus, adherent to tibia. Motion of ankle present. There was slight swelling and redness of the skin above the ankle, over lower one-fourth of leg. Deep pressure over lower end of tibia caused severe pain.

T 98°, p. 62, r. 18. Urine negative, leucocyte count 6,700, differential normal, Wassermann negative.

X-ray showed enlargement of the lower end of tibia, thickening of the cortex and loss of bone structure. At the center of this area were two definitely circumscribed areas of lesser density, one 3 cm. in diameter, the second 1 cm. in diameter, about ½ cm. of bone separating the two areas.

At operation (Jan. 25, 1924) skin incised, retracted. A hole was drilled into the tibia at site of larger area of lesser density and 1 cm. below surface the drill entered an abscess cavity. The anterior wall of the cavity was chiselled away and through the opening the lateral wall of the smaller abscess cavity was removed. The walls of both cavities were smooth, and filled with thin pus, the culture of which showed no growth. There was no fistula, no sequestrum. The cavities were packed lightly with gauze and the skin edges brought loosely together. The packing was removed on the third day and again lightly packed with sterile gauze. The cavity filled rapidly and the wound healed without fistula. The patient has returned to his former occupation and has remained well.

Case 2. An American youth, sixteen years of age, was seen for the first time on Sept. 18, 1925, complaining of pain in the right leg, below the knee. There was a history of a bronchial infection, beginning about Sept. 15, and lasting for a week. Two days after the subsidence of this the right leg below the knee became swollen, reddened and tender.

The mother of the patient gave the following history of the boy's condition. Eleven years ago, at the age of five, he was thrown from a tricycle, bruising the right leg below the knee. A month later the leg at the site of the bruise became swollen and reddened. Two months later there was a spontaneous discharge of pus from an opening which developed three inches below the knee. In August, 1920, and again in September, 1924, the leg became painful and swollen, and the skin around the old scar reddened. On both occasions there was relief of symptoms following rest in bed and applications of hot poultices. Since the last disturbance the boy had attended school and the leg was apparently normal until the onset of the present condition.

Physical examination showed a well nourished youth with normal findings except in the lower right leg. The right leg was three-fourth's inch shorter than the left. There was an old scar one inch long, three inches below the knee. The scar was depressed and adherent to the tibia. Pressure upon or near the scar caused severe pain.

X-ray showed marked broadening of the upper third of the tibia with loss of bone markings. There appeared to be great thickening of the cortex, with absence of the medullary cavity. Near the lower border of the thickened bone there was a circumscribed area 2 cm. in diameter, of lesser density.

Because of the history of old osteomyelitis, characteristic symptoms, and typical x-ray findings, a diagnosis of medullary bone abscess was made, and operation advised. The patient did not enter the hospital until Sept. 25, a week after the first examination, and at this time it was noted that the redness and swelling of the leg had disappeared, and the patient was free from pain. There was, however, a point of acute tenderness to deep pressure at the lower angle of the adherent scar.

Operation Sept. 26, 1925. The skin was incised at site of old scar and retracted. A hole was drilled near the lower border of the sclerosed bone to a depth of 3 cm. and the drill withdrawn, as no cavity was found. The drill was again introduced 1 cm. above the first opening and entered the abscess cavity. There was a discharge of thick yellow pus. The anterior wall of the cavity was removed, and the granulation tissue lining it was curretted until normal bone was encountered. The pus removed for examination showed pure culture of staphylococcus aureus.

The cavity diminished rapidly in size and the patient was discharged from the hospital on Oct. 30 with the wound nearly healed. On Nov. 25, he was able to walk without crutches and was free from pain.

Central bone abscess is a definite entity but often is not diagnosed. During the inactive period, when there is little or no pain, it may be overlooked, or may be mistaken for an arthritis or neuritis, and a focus sought elsewhere. In the active stage, when one's attention is directed definitely to the involved area, the condition may be confused with bone cyst or neoplasm.

When confronted with a chronic bone disturbance, characterized by intervals of remission and periods of exacerbation, the x-ray showing sclerosed, amorphous bone, usually with a central area of lesser density, one must consider the existence of a Brodie's abscess.

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ANATOMY OF SYMPATHETIC NERVOUS SYSTEM. It is the belief of S. W. Ranson, St. Louis (*Journal A. M. A.*, June 19, 1926), that no satisfactory explanation of the hyperemia following periarterial sympathectomy has yet been presented. It is equally impossible to explain the relief from pain which some patients experience after this operation. That there are sensory fibers supplying the blood vessels is well known, but these for the most part at least run centrally in the spinal nerves, and there is no reason to believe that they run in the periarterial sympathetic plexuses for any considerable distance. Perhaps the relief from pain may depend on the hyperemia and resultant improved peripheral nutrition. The anatomy of the sympathetic nervous system is described.

EFFECT OF EXERCISE ON THE CIRCULATION, SUGAR METABOLISM AND OTHER FACTORS*

Burgess Gordon, M.D.
PHILADELPHIA, PA.

Possibly there has been no interest during recent times in any form of recreation which has approached in keenness the interest in athletic competition. Competition of one type or another has always been an incentive to the individual to develop skill in some special manner. Among the ancients the Olympic games in Greece and the gladiatorial contests in Rome drew the most skilled athletes, and in the East during the earlier period of Persian history boys were taught the arts of horsemanship and archery, in addition to other exercises, and entered into competition frequently before large gatherings of people.

Although these early contests aroused public interest and individual talent, it is doubtful if they were inspired purely by the love for sport such as exists today. It is known that primitive races had periods of extreme physical training for youths because of the necessity for providing fighting men. Likewise nations in the early periods of their civilization maintained high standards of physical prowess, as for example, the ancient Chinese, the Greeks up to the age of Pericles, and the barbarian Goths at the time of the fall of Rome. When nations become effete, they lose interest in physical training except in the spectacular. Cicero, for instance, once remarked that the young men in his time were brought up by women and slaves, unversed in manly arts. They preferred to watch the gladiators in the arena rather than undergo the rigid training which athletic contests required.

Today there is not the tendency toward the merely spectacular which influenced Rome nor is there the chivalric ideal of the middle ages which found expression in fencing matches and engagements behind armored shields; nor still less the stern requirements of the savage to destroy a neighboring tribe. There is not merely the wish to develop physical beauty as the Greeks desired, but the impulse to enjoy the thrill of combat. There is a desire to excel not only individually but as a unit of a superior team. This is exemplified in modern football, baseball, hockey, rowing, etc.

This recent development of athletics has been noticeable not only in the large cities of our country but in the smaller towns. It is difficult to name a high school which has not a football rival as keen as Harvard is toward Yale. Every team has its supporters of loyal students, townfolk, parents and alumni. The newspapers and other periodicals are filled with reports on the games of the day. Elderly men and women are as enthusiastic as the young and are surprisingly well informed about the details of the games. Apart from the general interest in athletics and the thrill to the athletes themselves, there has been an increasing participation in athletic exercise because of the belief that it is conducive to good health. This feeling has been largely responsible for the required gymnasium instruction in schools and colleges.

There are those, however, who feel that athletics have been overstressed, and in not a few scientific journals there are warnings against over indulgence in gymnastics and in certain forms of athletic competition. It is not uncommon for parents to consult physicians about the danger of their children developing an "athletic heart," kidney, vascular or lung disease. Those who are participating in exercise ask the question at times directly. Moreover, with the extensive development of physical training and competition, there has been a wave of publicity about drugs and diets for men who would become superior athletes. The physician cannot be indifferent towards the subject of athletics. As time goes on, it is possible that he will be confronted more and more frequently with the problem of advising those who would begin physical training for such strenuous sports as football, long distance running and rowing. It seems, therefore, that a critical survey of the evidence, both for and against strenuous exercise, is of timely interest.

It is not the purpose to review historically the development of physical education, or to consider the scientific literature and discuss the various aspects of previous investigations. Many excellent works, such as those by MacKenzie[1] and Bainbridge,[2] on these subjects, are available. It is rather the plan to give in a general way the observations made on a group of animals[3] and marathon runners[4, 5, 6] at the Peter Bent Brigham Hospital in Boston and in some follow-up studies at the Department for Diseases of the Chest of the Jefferson Hospital in Philadelphia and to emphasize some points which may have a practical application.

The studies of special interest concern the heart and lungs, and certain changes in the sugar content of the blood. The heart studies were undertaken because of the very wide difference of opinion about the development of the so-called "athletic heart" and the question of acute dilatation of the heart following overexertion. The sugar observations were made to throw light on the mechanism of exhaustion which develops after effort.

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* From the Department for Diseases of the Chest, Jefferson Hospital, Philadelphia.

The early studies were made on animals. A group of normal adult rabbits and a number of other rabbits with myocardial changes produced by spartein sulphate[7] were exercised in a tread mill until exhaustion. They were then removed from the treadmill without delay. Roentgenograms were made of their hearts which were compared with films made before the exercise. It was found that all of the rabbits, including those with changes in the myocardium, showed a definite diminution in the size of the heart immediately following effort. The average decrease in size was about 19 per cent. It was striking to note that no dilatation of the heart occurred following acute overexertion, and there was no evidence that the general condition of the animals was adversely influenced by the strenuous effort.

The American marathon race in Boston in April, 1923, offered a particularly favorable opportunity to study the effect of effort on heart size. In this race the most experienced long distance runners in the United States and Canada competed. Many of these athletes had competed frequently in long distance races for several years and had spent a considable time in training for such contests. It not only was an opportunity to study the effect of a single strenuous prolonged effort, but also the effect of prolonged vigorous training on heart size.

The roentgenogram was selected for study because it offered the most satisfactory method for quickly and accurately measuring the transverse diameter of the heart. Through the cooperation of the Boston Athletic Association a roentgen ray apparatus was .installed in the club rooms near the finish line. It was possible to take the roentgenograms within two or three minutes after the runner completed the race. Successive films were made after the competitors had rested for one or two hours. In estimating the change in the heart size the measurements of the transverse diameter of the hearts obtained either before or several hours or days after the race were compared with those obtained at the finish.

It was found that immediately after the race all the hearts were small. This indicates that a strenuous prolonged effort did not cause acute dilatation of the heart. Successive roentgenograms taken during the course of one day, for the purpose of noting a prolonged effect on the heart size, showed merely a gradual return to normal. The hearts were also studied for evidence of hypertrophy by dividing the transverse diameter of the heart by the transverse diameter of the chest. According to this *cardiothoracic ratio* there was no enlargement present, the largest hearts being definitely within normal limits.

Auscultation was also performed on a number of athletes to determine any change in the heart sounds. With two exceptions they were essentially negative, one having extra systoles and the other a systolic murmur at the apex. It was found that both the irregularity and the murmur had temporarily disappeared after the race. The bases of the lungs were clear. The blood pressure observations failed to demonstrate any striking changes from normal with the exception of a moderate transient fall in the diastolic pressure immediately after the race. There was no evidence to suggest hypertension, except that in one instance a runner aged 37 years had a systolic pressure of 148, diastolic 92, after the race. Bradycardia was common.

The vital capacity of the lungs was found to be normal, indicating that prolonged vigorous training did not increase the breathing space of the lungs. There was a fall, however, of 17 per cent in the vital capacity immediately after the race which returned to normal within twenty-four hours.

In 1924 an examination of the constituents of the blood was made at the finish. In this study the sugar content was found to be normal in three runners, somewhat diminished in two, and markedly diminished in four. There was, furthermore, a close correlation between the physical condition of the runner at the finish and the level of blood sugar. It was found that those competitors with extremely low blood sugars presented a picture of shock not unlike that produced by an overdose of insulin.

In the marathon race of 1925 this information about the low blood sugar was utilized. The athletes were advised to employ an adequate supply of carbohydrate in their diet two days before the race. In addition, stations were arranged along the course to supply further carbohydrate during the running, when necessary. The blood studies showed normal sugar levels in all runners, in contrast to the low figures obtained the year previous. There was also a striking improvement in the general physical condition and in some instances a faster running time. It seemed, therefore, that the picture of exhaustion, weakness, shock, and other symptoms of hypoglycemia following prolonged effort could be prevented by the adequate and timely ingestion of carbohydrate.

During the past three years a number of the runners who competed in the race of 1923 and in numerous other races have been followed for the purpose of noting any permanent changes in the heart and lungs which could be attributed to long distance running. In this study no enlargement of the heart has been observed, which suggests that many years of the most vigorous physical effort do not produce cardiac hypertrophy. There have been no signs or symptoms referable to the circulation which indicated heart failure, such as irregularity of heart action, cough, edema, etc. It has been noticeable, however, that several of the runners are beginning to show tortuosity of the peripheral vessels with some sclerosis. This condition is occurring in runners somewhat under the age limit, when such changes would ordinarily be expected. The general build and figure of these runners, which is rangey with comparatively little muscular development except in the legs, may account for this appearance of the vessels. It is noticeable, however, that the weight and general development have changed very slightly since the first examination. There has been no elevation of the blood pressure.

In the roentgen ray study of the lungs there are few instances of a striking progressive increase in the hilus and bronchial shadows during the past three years. At present it is impossible to say whether such changes are the result of dust inhalation, infective or sclerotic processes in the bronchi or blood vessels. There is no occupation in the past history, other than running, which can be held accountable for such changes. One striking thing in these observations is that no symptomatology has developed in reference to the chest. These individuals have never been troubled in the slightest with cough, expectoration or shortness of breath, except during acute respiratory infections.

The physical examination of the lungs has been essentially negative except in a few instances, in which the breathing has failed to show the usual vesicular quality found normally over certain areas, the sounds being somewhat roughened. Over the hilus region the breathing has been louder than normal. No rales have been found except in one instance in which there was a typically asthmatic type of chest. This condition is known to have existed for three years without apparently having become aggravated by long distance running. Many of the runners show a moderate degree of emphysema with good expansion, but there are a number of instances of a flat type of chest with a somewhat limited expansion. So far as is known, the type of chest or the pulmonary changes have no relation to the "wind" or the ability of the athlete to run.

The diet of marathon runners and other athletes has been one of curious variation. Individual judgment is usually responsible for partaking of certain foodstuffs and discarding others, but it is surprising how often custom and hearsay influence a great number of athletes. It is a common practice to eat large quantities of red rare meats during the training season and some runners have been known to eat largely of egg and vegetable diets, while others have restricted themselves to fat and carbohydrate. There are all sorts of compromises and fads at the training table which change daily.

Henderson and Haggard[8] have recently shown that carbohydrate is utilized in the body as food energy more readily than fat, and Meyerhof[9] and Hill[10] consider that the primary fuel of muscle is carbohydrate. It seems reasonable to suppose, therefore, that carbohydrate should be an important part of the diet for athletes, especially in prolonged exercise. The value of such a food was suggested many years ago by Swiss mountain climbers, long distance walkers, and by other athletes accustomed to prolonged effort. They found that such diet with occasional feeding of chocolate during exercise had given them increased strength and endurance. Their judgment seems to be in accordance with the sugar observations on the marathon runners and on the reasonable supposition that the glycogen reserve is severely taxed in prolonged effort. This does not mean that athletes should go to extremes in carbohydrate diet and exclude fats and proteins, or upset their digestion by foods which do not agree with them. Such a diet should, furthermore, contain carbohydrate in proportion to the amount of exercise performed. It is unnecessary for obvious reasons to advise a high carbohydrate intake for short athletic contests, and even in baseball games the demands should be filled by the storage of glycogen obtained from a well balanced diet. The value of fat as a source of muscular energy should not be overlooked. However, it is often responsible for gastric distress, and there is a further disadvantage in that it is not readily converted into fuel for intense exertion.

The general build of the individual should also be considered. It is unlikely that the athlete of slender type, with the minimum amount of fat and muscular development, as is frequently the case in marathon runners, will carry an equal reserve of food energy as the individual of the same weight but of greater general development. The consideration should also be given to a certain number of athletes, as was shown in the marathon study, who apparently possess an economical mechanism for the control of chemical energy. They apparently require only a well balanced diet. The question of feeding carbohydrate during prolonged exercise should be answered by actual experience, such as the effect on digestion and the relief of symptoms of hunger and weakness. It seems that such feeding is especially indicated for long distance runners.

Regarding the hypertrophy of the myocardium which has been reported[11] in various animals following prolonged effort, it seems doubtful if a similar change could arise in man, even under the most extreme instances of human effort. That a concentric hypertrophy may be produced and be unrecognized by the roentgen ray is conceivable. However, such an alteration in the musculature is extremely rare in pathologic experience.[12] At present this can neither be finally proved nor disproved. This is also true of the remote possibility of anteroposterior changes which may be unrecognized by the usual roentgen ray film of the heart. It seems, however, from the available data that the athlete or the prospective athlete may be safely relieved of the fear of developing an enlarged heart even after many years of extreme physical exercise. When there is an underlying cardiac lesion or evidence of myocardial change, the problem assumes quite a different aspect. Participation in athletics under such circumstances should be advised with caution and with the usual regard for heart reserve and capacity for work. Failure to do so may cause or predispose to cardiac hypertrophy.

The questionable changes in the lungs and vessels cannot be disregarded for the present. It is doubtful, however, if the usual athletic activities, even if prolonged for twenty years or more, can approach the strenuous exercise of marathon running. It may be said that such changes have appeared only after prolonged effort of the most trying and strenuous type. Nevertheless, in those instances in which there are signs of an early hypertension or an hereditary background of vascular disease, it would be well to advise against over indulgence in athletics. The same caution should undoubtedly be observed when changes have been found in the lungs.

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1832 Spruce Street.

HEMORRHAGIC SMALLPOX

J. A. Weber, M.D.
AND
Frank H. Douglass, M.D.
SEATTLE, WASH.

This article presents and discusses in brief the cases of hemorrhagic smallpox, cared for at the Seattle City Isolation Hospital during the epidemic of January, February and March, 1926.

Exposure. There were ten cases in our series (see chart). Patients 1 and 4 were exposed to two cases of severe confluent smallpox, which were in turn exposed to a case of hemorrhagic smallpox. Patients 7, 8 and 9 were exposed to a case of hemorrhagic smallpox. Other patients exposed to this same case were two of hemorrhagic, one of confluent and two of discrete variola. These reveal the possible types resulting from any given case of smallpox.

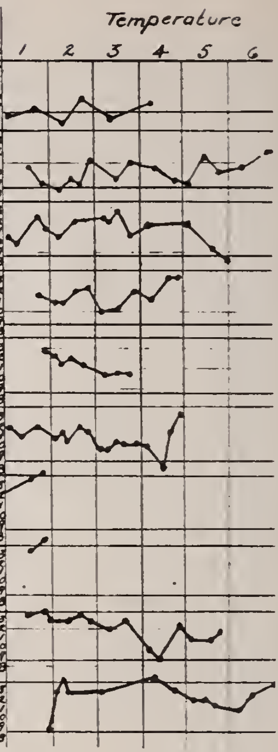
Age. The age incidence varied from 8 to 65 years.

Sex. Three were males, seven were females.

Race. All were white.

Symptomatology and diagnosis. The symptoms of hemorrhagic are not unlike those of ordinary

Patient	Age	Sex	Vaccination	Symptoms: Vomiting	Backache	Headache	Sore Eyes	Fever	Chill	Other	Hemorrhage: Cutaneous	Conjunctiva	Nasal	Oral	Uterine	Urinary	Stool	Gastric	Initial Stage Days	Erupt. to Death Days	Diagnosis	Degree
I	46	M	Successful when a child	+	+	+	+	+			+	+							3	3	Purpura Variolosa	105 102 101 100 99 98
II	23	F	No	+	+	+	+			Nervous	+	+	+	+	+	+	+		9	Recovery 48 Days	Variola Pustulosa Hemorrhagica	103 102 101 100 99 98
III	35	F	Unsuccessful 3 times	+	+	+	+	+	+	Nervous	+	+			+	+		+	4	2	Purpura Variolosa	105 102 101 100 99 98
IV	65	M	Successful 9 yrs. ago Unsuccessful recently	+	+	+	+	+		Nervous	+	+							3	3	Purpura Variolosa	103 102 101 100 99 98
V	53	M	Successful 1912	+	+	+	+	+		Prostration	+	+		+		+		+	12	4	Purpura Variolosa	103 102 101 100 99 98
VI	34	F	Unsuccessful when a child	+	+	+	+	+			+	+		+	+	+		+	4	4	Purpura Variolosa	103 102 101 100 99 98
VII	49	F	No	+	+	+	+	+			+	+	+	+		+	+		1	3	Purpura Variolosa	103 102 101 100 99 98
VIII	52	F	No	+	+	+	+	+	+	Sore Throat	+	+	+						3	3	Purpura Variolosa	103 102 101 100 99 98
IX	54	F	No	+	+	+	+	+	+		+	+	+	+			+		7	5	Variola Pustulosa Hemorrhagica	103 102 101 100 99 98
X	8	F	Unsuccessful 3 times	+				+		Pain in Abdomen	+	+	+	+			+	+	2	3	Purpura Variolosa	105 102 101 100 99 98



Report of Cases

smallpox. The more severe the onset the more grave are the manifestations of the disease. The duration of the initial and eruptive stages is much shorter than in the ordinary type of the disease. The clinical symptoms of ordinary variola are backache, headache, chills, fever and occasional vomiting, while in the hemorrhagic type there is an exaggeration of these same symptoms with the addition of persistent vomiting, sore eyes, muscle and joint pains.

There are two types of hemorrhagic smallpox: (1) Purpura variolosa, (2) Variola pustulosa hemorrhagica.

In our series the symptoms of purpura variolosa were more severe than those of the latter. The initial stages of purpura variolosa averaged four days. The subconjunctival hemorrhages preceded the scarlatiniform erythema characteristic of this type. Associated with the erythema were other mucous membrane hemorrhages, and cutaneous hemorrhages in the form of petechiæ and indigo purple ecchymotic blotches.

Next appeared the toxic stage, irritability and restlessness, followed later by drowsiness. These patients remained mentally alert, when aroused, until within a few minutes preceding death. The shortest time of death after onset (beginning of prodrome) was four days; the longest sixteen days, and the average seven days.

Our two cases of variola pustulosa hemorrhagica had an initial stage of seven and nine days. One case resulted in death five days after the appearance of the eruption. The other recovered without sequelæ after forty-eight days. At this time she was discharged from the hospital. The differential points, depending upon the exanthem, make the pustular type more difficult to diagnose. The eruption in this type appears as in discrete smallpox, in the form of small, shotty papular lesions which pass through the usual stages of vesiculation and pustulation. After the onset of the eruption, mucous membrane hemorrhages appear, as well as hemorrhages into the cutaneous lesions. Ecchymotic spots were frequent in the areas between the vesicles, more particularly about the hips.

Prognosis. In our series of ten cases, nine terminated fatally. The one surviving was that of variola pustulosa hemorrhagica. Referring to the Detroit epidemic of 1924, of the 124 cases reported, only one resulted in recovery. That case also was of the pustular type.

Prophylaxis and treatment. The prevalent idea that an individual having had a successful vaccination will not contract hemorrhagic smallpox is untrue, as is shown by our chart. Three of the patients were successfully vaccinated. The most recent vaccination was nine years previously. Four had never been vaccinated. Three had had repeated unsuccessful vaccinations.

The treatment in these cases consisted of immediate isolation and quarantine, forcing liquids, alkalinization, local applications of two per cent phenol in boric ointment, caffeine to stimulate and lower the renal threshold. Morphin was used for restlessness and irritability, fibrogen and calcium lactate to control the hemorrhage. The patient that recovered was given calcium lactate in fifteen grain doses three times a day. One ampule of fibrogen was also given twice a day for three days, at which time the mucous membrane and uterine hemorrhages ceased but her general condition was not improved. On the fourth day one ampule was given. On the fifth day it was omitted and on the sixth day one ampule was given again. After this time the cutaneous hemorrhages ceased and the calcium lactate and fibrogen were discontinued. Immediately following, her improvement began, although she continued the clinical course of a very severe smallpox.

CONCLUSIONS

Our experience impresses us with the seriousness of this malady. The symptoms of smallpox may simulate any of the acute infectious diseases.

In the presence of an epidemic severe symptoms, such as persistent vomiting, backache, headache and sore eyes, should be regarded with extreme caution and a guarded prognosis made.

It is invaluable that a physician should impress upon every one the importance of frequent vaccination. Vaccination of successful nature was not experienced in any of our series within a shorter period than nine years prior to the onset of the illness.

TREATMENT OF THROMBO-ANGIITIS OBLITERANS. Samuel Silbert, New York (*Journal A. M. A.*, June 5, 1926), has used repeated intravenous injections of hypertonic salt solution in the treatment of sixty-six cases of thrombo-angiitis obliterans. Improvements have resulted in the majority of patients, those noted being cessation of pain, increased temperature of the extremity, growth of the nails, healing of ulcers, and reopening of obliterated vessels. No dangerous reactions or untoward results of any kind have been noted in more than 2,500 injections. Four consecutive successful amputations below the knee have been done in four advanced cases after preliminary saline treatment. If begun before the disease is too far advanced, treatment of thrombo-angiitis obliterans by repeated injections of hypertonic sodium chloride solution will check the progress of the disease and will restore the patients to health and usefulness in the majority of instances. Only in the case of sodium chloride solution is there any originality in the method of treatment. Sodium chloride was selected for the hypertonic solution because it is the salt to which the body is accustomed, and because 15 gm. can be administered without danger of toxicity. The solution is prepared in freshly distilled water, filtered, and immediately sterilized.

PROGRESS IN BLOOD TRANSFUSION

LESLIE L. NUNN, M.D.
SEATTLE, WASH.

The transfusion of blood from one individual to another was known to the ancients and was looked upon with more or less awe. The procedure itself was accompanied by appropriate incantations and ceremonies. This, of course, was long before the discovery of the circulation of blood by Harvey. Therefore, the therapeutics of the measure were not understood.

The best known reference in ancient literature comes from Ovid. In the eight book of "Metamorphoses" he represents Medea as yielding to the supplications of Pelias that she renew his youth.

> Seizing a blade, Medea,
> A vein in the aged throat severed,
> And withdrawing the blood of the old man,
> In its place poured a life-giving fluid.

Succis, according to Ore, was a mixture of blood drawn from the veins of a black ewe infused with semen, with the entrails of the wolf, and hardly had she injected this mixture into the veins of the old man than the full vigor of his youth was renewed. It is evident that Ovid looked upon blood transfusion as an exhibition of the marvelous, and while attributing to a sorceress the power to perform it, had no idea of its possibilities as a therapeutic measure or its power to save life.[1]

It is not my purpose to go into details regarding the history of blood transfusion from ancient times to the present day, but rather to outline the rapid progress of technic and methods which have developed during the past few years, and to emphasize the fact that several of the older methods must be relegated to the scrap heap, if we wish to get the maximum benefit from the procedure.

INDICATIONS FOR TRANSFUSION

Indications for transfusion may be divided roughly into two classes: (1) acute and (2) chronic conditions. In the first group we naturally think of acute hemorrhage from any part of the body. Overwhelming hemorrhage, due to ulceration of any part of the gastrointestinal tract; postpartum hemorrhage, if seen after the patient has lost a large amount of blood; ruptured ectopic pregnancy, transfusion being a favorite procedure immediately previous to or at the time of laparotomy; acute hemolytic infections of the blood stream, causing rapid destruction of the red cells; surgical or traumatic shock. This condition, according to Crile, responds better to transfusions of whole blood than to saline or glucose infusions because of its maintenance of equilibrium in the blood pressure rise.

In the second class fall the anemias, both secondary and primary. Regardless of what has been said against multiple transfusions in primary anemia, we are ready to cite cases in which the periods of remission have been greatly lengthened by this procedure. Secondary anemia and cachexia respond remarkably well to transfusion. Other chronic conditions are hemophilia, especially if the individual is to be operated upon in any way; subacute bacterial endocarditis of the strep. viridans type; the chronic blood dyscrasias, as in Banti's disease, and splenic anemia, especially if operation is proposed.

SELECTION OF DONORS

In 1907 Jansky, and in 1910 Moss, made acceptable classifications of the blood groups. It is useless, in the face of a well equipped laboratory, to outline in this paper the technicalities of blood grouping. Suffice it to say, that Jansky's group I corresponds to Moss's group IV; otherwise they are the same. The knowledge of this fact may avoid confusion with laboratories using different classifications.

The donor should be a well-muscled and healthy individual, preferably a member of the patient's family, and should have a hemoglobin of 85 per cent or more. Needless to state, the Wassermann should be negative, unless, of course, the life of the patient depends upon an immediate transfusion, in which case we cannot wait upon the Wassermann report.

As regards typing the blood, this is beyond a doubt the most important step of the operation, and should be done by an expert technician, since the majority of reactions are due to faulty typing. In large hospital practices it is the custom to keep on hand a list of donors of known types and to draw on these as the occasion arises. However, it is quite an error to use a donor for a patient of the same group without first doing a cross agglutination, or what is commonly known as a direct typing. Jones[2] has shown that there are minor agglutinins in the blood serum that may cause agglutination, even if the two individuals are of the same group. By the same token the old theory of "the universal donor" (an individual belonging to group IV) is thus exploded. He has also collected a number of cases who have changed their types following gas and ether anesthesia, such change lasting three to four days. This last fact also indicates the necessity of cross agglutination before each transfusion.

TECHNIC OF THE OPERATION

Although the choice of methods is usually a matter of personal opinion, there are no doubt a few which are far superior to all others for many reasons. The ideal methods must be (a) simple in detail, (b) rapid, (c) "fool proof," and (d) one requiring a minimum amount of assistance. The old arteriovenous anastomosis is, of course, out of the question, not meeting any of the above requirements; likewise is the Kimpton-Brown tube, which must be in the hands of an expert. Out of the myriad of other methods we come down to a choice of these three methods:

1. The citrate method. This is probably the most widely used of any of the methods today, but should be condemned because of (1) the many severe reactions following transfusion, and (2) danger of contamination due to the open container.

2. Lindeman method. In certain sections of the country this has become very popular during the past few years, and has proved quite successful. However, it too has many disadvantages. It requires at least one assistant and one nurse; it is necessary to have a number of basins of solutions and high priced syringes in order to perform the operation successfully. It is to be condemned because of the fact there is undoubtedly a danger of infection arising from the syringes passing through three pairs of hands and three different solutions many times during the operation. Furthermore, even in the most expert hands, considerable blood is lost in changing syringes, and in so doing there is danger of admitting air into the vein even though a small amount is not particularly harmful.

3. Unger method. This was devised by Lester Unger of New York City, in 1915, and was popularized during the late war. We believe that this method meets every requirement laid down above. One man, if necessary, can perform the entire operation without assistance.

Essentially, the apparatus consists of a two-way valve which clamps on a board or small table between the two parallel carriages or tables holding donor and patient. The tip of a 20 c.c. Record syringe fits horizontally into the valve which has a six inch piece of small rubber tubing running to a needle in the donor's vein and a similar one from the opposite side to the vein of the patient. In the side of the valve opposite the syringe is an inlet, through which saline can be injected, if desired to flush the valve of blood.

When ready to operate, the donor and patient are placed parallel about eighteen inches apart with the feet in opposite directions, and tourniquets are placed on the arms. The operator inserts a Pilling needle into the donor's vein with the point toward the hand; likewise, one into the patient's vein directed toward the shoulder. When the needles are properly in the veins, the patient's tourniquet is released, the valve is turned to the donor's side and the syringe fills under pressure from the donor's blood stream. The valve is then turned to the donor's side and the 20 c.c. of whole blood is injected. While collecting from the donor it is desirable to allow 2-3 c.c. saline to flow through the valve to the patient to insure a clean valve and tube. This process is repeated until the desired amount is given. It is never necessary to wash the syringe but it is sometimes necessary to have an assistant or nurse spray a little ethyl chloride on the syringe barrel to prevent swelling due to the warm blood.

By this method 500 c.c. can be transferred in four minutes without losing a drop of blood or at at any time disconnecting the apparatus. It is an absolutely closed method and the risk of infection or air emboli is nil. It is rapid and simple; one man who can insert a needle into a vein can transfer any desired quantity of blood in a few minutes.

REACTIONS FOLLOWING TRANSFUSIONS

These are due, of course, primarily to the injection of a foreign protein into the blood stream. The reaction may be immediate or delayed, the latter of which is the more frequent. If the blood of the two individuals has not been cross agglutinated, even if they are of the same group, we must watch for an immediate reaction which is usually as follows: After a few c.c. of blood have been injected, the patient grows short of breath, the pulse rate rises and he becomes somewhat cyanosed. These symptoms, together with a dry hacking cough, warn us that it is time to quit. The delayed reaction usually appears with two to six hours. There is usually a chill, followed by more or less of an urticarial eruption and a rise in temperature of from 2 to 4 degrees F. Occasionally there is vomiting and great prostration.

The cause of a reaction can usually be found to be due to one of the following: improper typing, failure to agglutinate, citrated blood, poor technic, too large amount of blood, too rapid a transfusion.[3]

Treatment. Prophylaxis is the best treatment. Be sure that cross agglutination is properly done. See that the patient goes to the operating room with an empty stomach. Immediately following transfusion in *every* case in adults, give one-sixth gr. morphin with 10 m. adrenalin to prevent a reaction. If this occurs in spite of our prophylaxis, the favorite treatment is large doses of morphin and adrenalin and external heat.

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Method of Stripping Seminal Vesicle. The method which Edward S. Pomeroy, Salt Lake City (*Journal A. M. A.*, June 19, 1926), has adopted is to cleanse the penis with tincture of green soap, wash the parts with mercuric chloride solution, wash out the urethra with boric acid solution, and then instill 10 c.c. of sterile 1 per cent butyn through the urethra, up past the external sphincter into the prostatic urethra with an ordinary sterile urethral syringe. This is massaged well into this region by rubbing it along the urethra and perineum, and then a rectal suppository containing 2 grains (0.13 gm.) of butyn is inserted into the rectum. A few minutes are allowed to obtain good anesthesia, after which we find that the rectal muscles are usually well relaxed. The patient is placed in the position most desired by the surgeon for massaging the glands (Pomeroy prefers either the standing position with good flexion at the hips, or the knee-chest position on the examining table), and with the forefinger covered with a cot, the finger can be pushed well up into the pelvis beyond the prostate; and, swinging over to one side, there is usually no difficulty in finding the seminal vesicle. Beginning as high as possible, the finger is brought down along this organ firmly with a rapid stroke, which is repeated in a series of rapid strokes with a milking motion for several seconds. Then, if any areas of induration are felt, a steady, firm continuous pressure downward is made on each of these for a few seconds. The same prostate is massaged in the customary manner. If there are any coagulated agglutinated masses of pus and detritus in these organs, they are brought down into the prostatic urethra where they lie, too heavy to pass through it until washed out by an irrigation, and are seen if collected in a sediment glass often in sufficient quantity to settle in several inches thickness at the bottom of the glass. Following the stripping and massage, the deep urethra is instilled with mercurochrome-220 soluble. From three to twelve of these treatments usually free these organs of the most important masses of pus, and only the usual seminal and prostatic fluids remain, which most often now unfortunately show an excess of leukocytes for a persistently long period. In 200 cases of chronic seminal vesiculitis, in which treatment was done in this manner, all the patients gave histories of gonorrheal infection of from four months to many years standings, with "morning drops," recurrences of acute exacerbations of freely flowing pus from the urethra, local irritations, epididimytis, and the usual array of manifestations characteristic of this affection. Eighty-five per cent of the patients manifested symptoms of backache, loss of weight, lowered vitality and depression in varying degrees, and 15 per cent were practically free from all these symptoms except the "morning drop" or some local irritation.

NORTHWEST MEDICINE
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EDITORIAL

THE SHEPPARD-TOWNER QUESTION

The five year period will terminate June 30, 1927, during which the Sheppard-Towner act will have been in force in accordance with the action of Congress of November, 1921. This act was intended to stimulate and aid the states in protecting and promoting the health of mothers and infants. It provided that money collected from the people through federal taxation should be distributed among the states acording to population, on condition that a state accepting this contribution would contribute an equal sum, the administration of the fund being placed in the hands of federal officials. It has been admitted that the federal government has no right to control matters of this kind by direct federal legislation, although decision by the Supreme Court has not yet been delivered. While it was generally supposed that the life of this act was for a period of five years, its proponents have openly declared that they consider it permanent legislation and, hence, they are justified in asking for a further appropriation for two years.

At this time it seems fitting to consider whether or not this act has justified its existence and deserves further extension of activities. Its supporters claim that there has been a substantial decrease in infant mortality and maternity death rates since its establishment. They state that during the years 1922-24, infant mortality for the registration area fell from 76 to 72 and maternity death rate from 6.8 to 6.6. On the other hand, the records show that during the three years immediately preceding the activity of the Sheppard-Towner act, namely, 1919-1921, the infant mortality rate fell from 101 to 76 and the maternity mortality rate from 9.2 to 6.8.

During the discussion of this measure, Senator Sheppard claimed that nearly 20,000 mothers, and almost 200,000 infants under one year of age die in the United States every year from lack of proper knowledge as to the hygiene of maternity and infancy. The inaccuracy of this statement is evidenced by the recently published Mortality Statistics for the year 1923, which show that in the registration area, including about 90 per cent of our total population, there were 166,274 deaths of children under one year of age from all causes. Furthermore, this report states that the total number of mothers dying from accidents of pregnancy and labor, hemorrhage, blood poisoning and all other conditions incident to the puerperal state was only 15,505. This indicates the incorrect and exaggerated attitude of those defending this measure. Senator Sheppard also stated that the death rate of mothers in the United States from these causes was the highest for any nation in the world, for which recent figures could be obtained, and that seven foreign countries had infant rates lower than the United States. As bearing on this question, the Bureau of Census says, comparing the rates of 1923 with those of 1915 for puerperal septicemia, the United States shows the same rate for both years, England and Wales a reduction of 13.3 per cent, Australia an increase of 30.8 per cent, New Zealand an increase of 130.5 per cent and Scotland the same per cent.

In this discussion the important question arises, why in an effort to conserve the wellbeing and development of childhood should the government authorities concentrate their efforts on reduction of maternity and infant mortality, when there are so many other factors which pertain to these interests, perhaps with equal importance. There are the matters of general hygiene, diet, sewage, climatic conditions and others which have a distinct bearing on infantile rearing and mortality. All of these factors in reality belong to the work and supervision of the state boards of health and welfare interests. One might suspect that the interference of the federal government in these matters may be, in part at least, for the purpose of providing comfortable berths for an increased number of officials.

While most of the states have participated in the Sheppard-Towner distribution of funds, a number of the eastern and middle states have refused to take advantage of the act. Since all of the states of the Northwest are connected with this measure, would it not be well to ascertain to what extent the people of each state have been benefited during the period in which this act has functioned. To what extent will the individual state initiative be hampered by this government supervision of activities which normally would come under the jurisdiction of the states? The matter seems of sufficient importance for the health authorities of each state to determine for themselves whether or not they should continue to participate in the execution of this act.

EXPLOITING THE CANCER PATIENT

The victim of an incurable disease is always ready to grasp the method of treatment which is offered with an assurance of cure. In the past tuberculosis has competed with cancer as the productive field, in which have thrived patent medicines and quackery in the exploitation of the victims of these ailments. Since the discovery of the tubercle bacillus and the establishment of the treatment of tuberculosis on a rational basis, cancer has been left as the special domain for an endless number of sure cures.

Of late much attention has been called to the treatment originated by Koch, of Detroit. While some trustworthy observers have expressed their opinion that there may be some merit in this line of therapy, its method of presentation to the profession and the propaganda employed for publicity have met universal condemnation. It is an established principle in the realm of medicine that the secret formula and secret method of production are fatal to the adoption of any sort of therapy. This is the first absolute bar to the acceptance of this remedy. The method employed for its administration smacks of the charlatan. Before its employment in a given case, the patient is required to pay in advance a minimum of $300, this sum being often demanded for a single injection, one half of which is to increase the bank account of the physician in charge of the case. Of course this fee splitting is without the knowledge of the patient. It is not known whether the distribution of this preparation is always entrusted to practitioners in the twilight zone of medicine, but in Seattle it is under the supervision of discredited disciples and exponents of the Abrams treatment. "Nuff sed."

The profession of the country has been circularized by pamphlets emanating from the Koch corporation, which hurls its thunderbolts at the American Medical Association on account of its hostile attitude to this form of therapy. Pamphlets of this sort commonly result in added condemnation of the remedy in question. The investigations and analyses of the Council of Pharmacy form a bulwark for the medical profession against deceit and misinformation regarding the production of medicinal preparations. Any substance branded by this committee shows the result of careful investigation and is published only after knowledge of all available facts has been acquired. It is perfectly natural for the producers of rejected preparations to proclaim from the house tops that they are being abused and misrepresented, but as a result of long experience in these matters the medical profession as a body realizes that truth and justice reside with the American Medical Association and its Council.

INCREASE OF INSANITY

A recent publication of the Bureau of Census presents some interesting figures regarding patients in hospitals for mental disease during 1923. These figures cover the 43-year period during which statistics have been collected. In 1880 there were 40,942 patients in insane hospitals against 267,617 in 1923, an increase of 563.6 per cent. The number of patients per 100,000 of the total population increased from 81.6 to 245. These figures by no means indicate an equally extraordinary increase in mental diseases, which is explained partly by reason of a more general use of hospital care in recent years. While it was formerly customary, for instance, for the family to care for the senile dement, these cases are now more commonly sent to the state institution. There is a much keener recognition these days of insane conditions. Under the more common diagnoses, one of the outstanding is the recognition of mental pathology with syphilitic psychosis for a basis.

A notable fact in these statistics is the disproportionate amount of insanity among the foreign born. Of the 244,968 resident white patients in 1923, 69.1 per cent were native and 28.6 per cent foreign born, but of the total white population at the census of 1920, 85.5 per cent were native and 14.5 per cent were foreign born. The figures show that in the United States as a whole in 1923, the number of resident patients per 100,000 population of the same nativity was 209.9 for native white and 513.9 for foreign born whites. In this connection, however, should be noted the larger proportion of foreign born whites in the higher aged periods, considered in connection with the increase of mental diseases with advancing years. This greater proportion of foreign over native whites is observed in every city of the Union.

The figures for the whole United States show 245 patients in insane hospitals per 100,000 population January 1, 1923. Referring to the states of the Northwest, we find Oregon had a total of 2,666 patients, with 328.4 per 100,000 population; Washington 3,815 patients, with 270.2 per 100,000; Montana 1,438 patients, with 242.3 per 100,000; Idaho 609, with 132.6 per 100,000. It is interesting to observe that the highest rate per 100,000 is in District of Columbia, being 898.4, followed by Massachusetts with 399, New York 382.6. This publication does not mention the relative increase in total population during these periods of comparison, which would be an interesting observation in this connection.

HEALTHIEST SECTION OF THE COUNTRY

With each annual publication by the Bureau of Census, attention is called to the healthful report from the states of the Pacific Northwest. The recent publication, covering birth, death and infant mortality figures in the registration area for 1925, discloses a repetition of what has appeared in past years. The death rate per thousand population records the highest for Vermont 14.6, with the lowest, 7.7, for Montana and North Dakota. Infant mortality rates were generally higher than for the preceding year. The highest, 90.4, appears for Maryland with the lowest, 51.2, for Oregon. Washington presses closely after with a rate of 56.5. For cities of 100,000 population or more the highest rate is for Norfolk, 96.7, while Seattle presents the lowest with 44.9, Portland crowding very close with 45.9. Among cities just below 100,000, however, Tacoma has a still better record of 44 and Vancouver 43.6. It is interesting to note the birth rate per 1,000 population which shows North Carolina the highest with 28.8 and Montana the lowest with 15.1. These figures indicate that the people of our Northwest states ought to be satisfied that they are living in a very healthy section of the country.

THE VICTORIA CANADIAN MEDICAL ASSOCIATION MEETING

A physician beginning practice in the Pacific Northwest often feels that he is hopelessly cut off by long distances from the stimulating effect that is obtained by mutual interchange of ideas with representatives of other medical centers in our vast land. He may little realize that by a few hours travel he can come in close and inspiring contact with a different, in reality an international point of view. We refer to the frequent opportunities in recent years for physicians of the Northwest to attend meetings of Canadian medical societies. For the second time in its history the Canadian Medical Association has convened in British Columbia, this year at Victoria June 21-25.

The first two days of the meeting were devoted entirely to business and legislative transactions. British Columbia was honored by the installation of Dr. Forrest Leeder of Victoria as President of the Association. The program of the scientific sessions continued throughout the remaining three days. The far reaching influence of British medicine was indicated when short addresses of greeting were delivered by representatives of the medical societies of Great Britain, South Africa, and China. Dr. J. Tate Mason of Seattle, chairman of the surgical section of the American Medical Association and her official delegate to the sister organization, stated that he hoped to see the early establishment of a custom of joint meetings of the physicians of Canada and the United States at intervals of five to ten years. This suggestion was enthusiastically received by the assembly and it is hoped will bear fruit.

Papers were read by Canadian, English and American physicians of national and international reputation. There appears to have been a distinct effort on the part of the majority of the speakers to present their subjects in such a manner as to appeal to a general rather than to a special audience. The recent trend in medical conventions in the direction of symposiums was reflected by such a consideration of two subjects of wide interest. Goiter and duodenal ulcer were discussed by several contributors, each of whom presented a phase of the subject from the angle of his special knowledge.

It was but proper and fitting that the two men who have in recent years made the most outstanding advances in Canadian experimental medicine should be honored by prominent places on the program. Dr. F. G. Banting of Toronto, the discoverer of insulin, spoke on the subject of "Medical Research." Dr. J. B. Collip of Edmonton presented his recent and important work in the field of endocrinology, the title of his paper being "Recent Advances in the Physiology of the Parathyroid Glands." Among the American contributors to the program were Drs. L. G. Rowntree and Willis Lemon of the Mayo Clinic, who spoke respectively on "Some Phases of Renal Function," and "Cooperative Diagnosis and Treatment between Physician and Consultant." Dr. H. C. Moffitt of San Francisco discussed the medical phase of the symposium on "Duodenal Ulcer."

A number of special societies held meetings during the convention of the national body. The North Pacific Pediatric Society, whose membership includes both Canadian and American representatives in the specialty, had its semiannual meeting on June 22 under the presidency of Dr. E. J. Barnet of Spokane. Among the topics discussed were "Diagnosis and Treatment of Enlarged Thymus" by Drs.

Howard Spohn and H. A. Rawlings of Vancouver, B. C.; "Acrodynia" by Dr. Gordon Chown of Winnipeg; "Postural Defects in Childhood" by Dr. Herbert Coe of Seattle; and "Erythema Induratum" by Dr. J. B. Bilderback of Portland. The Canadian Radiological Society had an attractive program.

The convention was conveniently and comfortably housed at the Empress Hotel. Several of the Canadian medical schools contributed to an excellent scientific exhibit. There was a large commercial exhibit, in which products and apparatus of American firms were shown along with those of Canada and Great Britain. The lure of a convention in a famed vacation spot attracted Canadian and American physicians in large numbers. The latter were most hospitably received in the assemblies as well as in the gatherings for entertainment. The local golf clubs extended the privileges of their courses to all visitors and an official golf tournament was held. A boat trip to the Dominion Quarantine Station and to the Leper Colony at Bentinck Island was arranged. For the ladies there were daily motor rides and receptions and teas at several of the more famous country estates. Those physicians of our northwestern states who did not accept Medical Canada's kindly invitation should not in the future allow an opportunity of like nature to pass.

MEDICAL NOTES

The Annual Beaumont Memorial Award. To encourage investigations of alimentary tract function, Dr. Frank Smithies, Chicago, has presented to the School of Medicine of The University of Illinois, bonds in amount sufficient to yield annually, in perpetuity, not less than $100.00. This fund is known as "The William Beaumont Memorial Fund" and the income therefrom as the "The Annual Beaumont Memorial Award."

The Award is to be made each year to the research or clinical investigator who, in the judgment of a Faculty Committee, has contributed the most important work during the year, in the field designated.

The first Award will be made in 1927. Manuscripts covering investigations do not have to be entered specifically for the Award nor is it required that they be submitted to the Faculty Committee. The Award is to be granted by the Committee after it has considered carefully all investigations published during any year in periodicals throughout the United States. Thus, the Award is available to workers in any institution, and is not confined to members of either Faculty or Student body of The University of Illinois.

Mail Directory Information Card Promptly. During the month of June, every physician in the Northwest should have received a Directory information card. Every one is urged to fill out and return the stamped card regardless as to whether he or she has changed their residence or office address.

This information will be used in compiling the Tenth Edition of the *American Medical Directory*, now under revision in the Biographical Department of the Association. The Directory is one of the altruistic efforts of the Association and is published in the interest of the medical profession which means ultimately in the interest of the public. It is a book of dependable data concerning the physicians and hospitals in the United States and Canada.

Anesthetists Meet. The annual meeting of the Mid-Western Association of Anesthetists will be held October 11-14, 1926, in Kansas City, Mo., at the same time as the Clinic Week there. Headquarters, Baltimore Hotel. An interesting and attractive program is in progress of making. Any physician or dentist desiring to read a paper should send the title of his paper very soon to the secretary, Ralph M. Waters, M. D., Sec-Treas., 425 Argyle Bldg., Kansas City, Mo.

OREGON

Open House for Medical Building. There was a formal opening for Medical Arts building, Portland, June 17. This million dollar building is owned by doctors and dentists of the city who operate it on a cooperative plan. The building also houses the Doctors' Exchange and the Nurses' Registry, as well as officers of the state board of health, board of pharmacy and board of dentistry. In the rear of the building is a garage for the accommodation of doctors and dentists.

New Tuberculosis Hospital. Hilltop Tuberculosis Sanatorium is the name of a new institution for Clackamas county, about three miles from Oregon City. It is established on Underwood farm of about 48 acres, recently purchased for this purpose. Five-room bungalows are being erected, each of which will accommodate three patients. There will be a dairy farm containing cows and goats. Dr. Caroline C. Bell is president. Dr. T. M. Maguire, of Portland, is vice-president and superintendent of the institution.

Isolation Hospital. It is proposed to build an isolation hospital in Eugene. It will be conducted by representatives of Pacific Christian and Mercy hospitals, with the mayor of the city and one of the judges.

Isolation Hospital to be Built. An isolation hospital will be built in Klamath Falls this summer at a cost of $5,000. It is stated that the county will bear half the cost of construction and pay one-half the maintenance.

In Charge of Hospital. Dr. Merle W. Moore, of Portland, a recent graduate of Jefferson Medical College, has been appointed physician in charge of the Sesqui-Centennial hospital of the Philadelphia exposition. When the exposition closes he will join his father and brother in practice in Portland.

Returned from Europe. Dr. Ray W. Matson, of Portland, returned home May 27, after nine months spent in Europe. Most of the time was devoted to study in Vienna, which was supplemented by touring Italy, France and Switzerland.

Elected Section Chairman. At the meeting of the American Medical Association at Dallas, Dr. William House, Portland, was elected chairman of the Section of Nervous and Mental Diseases.

Dr. M. E. Wilson, who has recently practiced in Portland, has moved to Myrtle Point, where he will practice in the future.

Dr. R. S. Waltz, of Portland, who has recently been connected with the Multnomah hospital, has located in Forest Grove.

Reelected to Office. Dr. O. A. Waller, of Eugene, has been reelected chief of staff of the Pacific Christian hospital.

WASHINGTON

Detention Hospital to be Reopened. The Woman's Detention hospital of Seattle, for the treatment of venereal diseases, is to be reopened in the old Courthouse building. The present mayor, Mrs. Bertha K. Landes, and Health Commissioner Hanley have provided for this measure, the hospital having been closed during the previous city administration.

The Burbank Fund. Dr. C. H. Burbank, an aged physician who recently died in Seattle from diabetes, contributed funds for the establishment at the Seattle General hospital of a ward of three beds for diabetic boys. Its purpose is not for short hospitalization over a period of acute disturbance, but to provide a prolonged hospitalization covering a year's time, to see if accurate care and attention over a prolonged period cannot influence the underlying diabetic condition.

Contract Let for Hospital. The general contract has been awarded for the addition to the Grays Harbor tuberculosis sanatorium at Elma. The price is $21,453. Heating, plumbing and other equipment will bring the total to about $150,000.

Elected to Hospital Staff. Dr. L. G. Woodward, of Everett, was recently elected president of the staff of Providence hospital of that city.

Reservation Sanatorium. The United States Government buildings at Fort Simcoe, thirty-five miles from Yakima, on the Yakima Indian reservation, are to be converted into a tuberculosis sanatorium for the benefit of the 12,000 Indians in Washington. Many years ago this was built as a military out-post; later it was made agency headquarters for the Yakima reservation, but for several years past has been unoccupied. A dairy farm and poultry plant will be established in connection with the institution.

Annual Meeting of Association. Washington Tuberculosis Association held its annual meeting in Bellingham, June 14-16, attended by physicians and laymen of various cities interested in this subject. Dr. W. B. Penney, of Tacoma, president of the Pierce County Tuberculosis League, presided. Papers were read on various phases of tuberculosis by representatives from tuberculosis sanatoria of the state as well as from British Columbia. One afternoon was devoted to a symposium on education, child health and health education being specially stressed.

Funds for New Hospital. Citizens of Chehalis last month paid much attention to raising funds for the construction of a new hospital in that city. It is proposed to construct and maintain an up-to-date institution.

Appointed Health Officer. Dr. O. J. Moorehead, of Walla Walla, has been appointed health commissioner for the city and county, filling the position formerly occupied by Dr. J. E. Kane. He has been engaged in this capacity during the past six months.

Osteopaths Denied Narcotic Permits. Osteopathic physicians who have been permitted in the past to receive and dispense narcotics have been refused such permits by the Federal Narcotic Bureau. This action was taken on the advice of the chief of federal narcotic agents of the Northwest, on the advice of the attorney-general's office of this state, and a ruling from Washington, D. C., to the effect that under the Beeler Washington antinarcotic statute only physicians, dentists, surgeons and veterinarians are permitted to administer narcotics. The Harrison act provides that dispensers of narcotics must be qualified under state laws. About 150 osteopaths in the state are affected.

Chlorinating Bathing Beaches. Dr. A. T. Hanley, health commissioner of Seattle, has asked an appropriation of $15,000 for chlorinating Lake Washington bathing beaches. Unless this is done, he states, the bathing beaches will be closed as unsafe, recent tests showing from fifty to seventy-five organisms to the drop of water at these beaches. This process will be merely a makeshift until an intercepting sewer system is constructed.

License Rescinded. Considerable criticism was evoked a short time ago when the commissioner of licenses, at Olympia, restored the license to Dr. Annie K. Russell who was disbarred from practice in 1915. This action was taken without consulting the medical authorities of the state. The State Bureau of Licenses has recently rescinded the action of Feb. 8, which had restored this license.

President of Section. At the recent Dallas meeting of the American Medical Association, Dr. J. Tate Mason, of Seattle, was elected chairman of the Section on Surgery, General and Abdominal.

Appointed Epidemiologist. Dr. L. S. Dewey, Okanogan, has been appointed collaborating epidemiologist for Okanogan county by Surgeon General Cummings of the U. S. Public Health Service.

Dr. J. J. Markey, of Seattle, diagnostician of the Washington Tuberculosis association, has gone abroad for a three months' period of study in European cities. He will conduct a group of Denver physicians for this tuberculosis study.

Dr. C. R. Morrison, who practiced for eight years in Oklahoma, has located at Nooksack, where he will practice for the future.

Dr. Albert C. Stewart, who has been clinical director of U. S. Veterans' Hospital No. 94, has resigned and has become associated with Dr. J. W. Snoke in the management of Puget Sound Sanatorium at Puyallup.

Medical Weddings. Dr. C. B. Ward, of Spokane, was married to Mrs. Verna Kendall of that City May 26. Last month they sailed from New York for several months' study and travel in Europe. Dr. C. A. Veasey, Jr., of Spokane, was married to Miss Helena White Gray, of Sewickley, Pa., June 23.

IDAHO

New Medical Society Organized. Physicians of Latah, Benewah and Clearwater counties held a meeting at Moscow, May 15, and organized a Tri-County Medical association, including the above mentioned counties. The following officers were elected for the ensuing year: President, Dr. J. W. Stevenson, Moscow; vice-president, Dr. E. C. Gibson, Potlatch; secretary-treasurer, Dr. J. H. Einhouse, Moscow.

Board of Eugenics. The state board of eugenics, created without an appropriation by the recent legislature, organized last month. Under the law members of the board include warden of the state penitentiary, superintendent of St. Anthony Industrial Training School and Dr. F. M. Mitchell, superintendent of the Blackfoot asylum, together with Dr. J. I. McKelway, superintendent of the Orofino asylum; Dr. D'Orr Poynter, superintendent of the Nampa institution for the feeble-minded and Dr. Ralph M. Fouch, state medical advisor, who is ex-officio secretary.

Medical Missionary to Africa. Dr. J. H. Sturges, of Coeur d'Alene, has left with his family for Scotland, where he will spend several months in study. Later he will go to Belgian Congo region, where he has a seven years' appointment in charge of a mission hospital for the Seventh Day Adventists.

Appointed Epidemiologist. Dr. J. W. Stevenson, of Moscow, has been appointed assistant collaborating epidemiologist for the state of Idaho by the Surgeon General of the U. S. Public Health Service.

New Hospital Opened. The new Sandpoint hospital has been fully equipped for care of surgical and maternity cases. It has been owned, and has recently been remodeled, by Miss Elizabeth Phinney and Mrs. Nettie Prater.

Canyon County Medical Society, at a meeting held at Nampa, May 19, elected the following officers for the ensuing year: President, Dr. T. D. Farrer, Caldwell; vice-president, Dr. H. P. Belknap, Nampa; secretary-treasurer, Dr. Samuel Swayne, Nampa.

Kootenai County Medical Society held a meeting last month at Coeur d'Alene. Dr. John T. Wood of that city was elected as Secretary for the balance of the year, in place of Dr. J. H. Sturges who will become medical missionary in Belgian Congo, Africa.

Dr. E. L. Spohn, recently of Los Angeles, Calif., has arrived at Coeur d'Alene, where he will be associated in practice with Dr. H. J. Sturges.

OBITUARIES

Dr. James Shannon died in Seattle, Wash., May 28, aged 67 years, from disease of the heart. He was born in Marmora, Ontario, 1859. He graduated from a normal school at Ottawa and taught school for several years. He came to Seattle in 1882 and shortly after that went to California, where he graduated in medicine from Cooper Medical college. He was first intern in the old San Francisco County Hospital. He located in Seattle for practice in 1886 and was one of the oldest practitioners in that city. During this long period he was associated in practice with his brother, Will, who died two years ago. They were among the best-known physicians of the city.

Dr. J. L. Atkinson died at Poplar, Mont., May 20, after an illness of more than a year's duration. He settled in this country more than thirty years ago as governmental physician at the Fort Peck Indian Agency. Several years ago he resigned from this position and has since been engaged in a large private practice.

Dr. W. S. Herdman, of Vashon Island, Wash., died May 23, aged 76 years. He practiced in this state for forty years. He was a graduate of Stanford University. Several years ago he retired from practice and lived with his daughter at Vashon.

Dr. C. H. Reed, of Burton, Wash., died June 9, at Olympia, aged 76 years. His death was sudden, as a result of disease of the heart. He had practiced on Vashon Island for the past ten years.

Dr. John J. Mustard, of Olympia, Wash., died June 13, aged 48 years, after an illness of a year's duration. He was born in Ontario, Canada, in 1877. He graduated from Jefferson Medical college and University of California. He located in Olympia in 1914 and since that time has been prominent in medical affairs in that part of the state.

MEDICAL RESERVE CORPS

The following changes of assignment status of members of the Reserve Corps are announced:

Major John H. Garberson, Med-Res., 21 So. Jordan Ave., Miles City, Montana, assigned to 85th Evacuation Hospital, 3rd Army, as Assistant to Chief of Surgical Service.

Major William R. Morrison, Med-Res., 235 Hart-Albin Bldg., Billings, Montana, assigned to General Hospital No. 145, Zone of the Interior, as Commanding Officer.

Capt. Adolf L. Drtina, Med-Res., 2002 Tenth Ave. N., Seattle, Washington, assigned to General Hospital No. 50, Communications Zone, as Medical Ward Officer.

Capt. William E. Long, Med-Res., 416 Main St., Anaconda, Montana, assigned to General Hospital No. 145, Zone of the Interior, as Surgical Ward Officer.

Lieut. Col. Oliver R. Austin, Med-Res., Aberdeen, Wash., assigned to station Hospital No. 138, Communications Zone, as Commanding Officer.

Major Calvin S. White, Med-Res., 1308 E. 32nd St., Portland, Ore., relieved from assignment to Station Hospital No. 138, Communications Zone.

Major Ole A. Nelson, Med-Res., 3817 W. 69th St., Seattle, Wash., assigned to 86th Evacuation Hospital 6th Army, as Assistant to Chief of Surgical Service.

1st Lieut. Myron S. Jared, Med-Res., 306 Stimson Bldg., Seattle, Wash., assigned to 425th Collecting Company, 349th Medical Regiment, IX Corps, as Company Commander.

1st Lieut. Arthur J. Johnson, Med-Res., St. Helens, Ore., assigned to General Hospital No. 46, Communications Zone, as Medical Ward Officer.

Capt. Frank C. Vanatta, Med-Res., Cascade, Mont., assigned to General Hospital No. 145, Zone of the Interior, as Medical Ward Officer.

The following-named Medical Department Reserve Officers assigned to General Hospital No. 141, Zone of the Interior:

1st Lieutenant Archibald W. Howe, 1616 Washington Bldg., Tacoma, Washington, as Surgical Ward Officer.

1st Lieutenant Scott S. Jones, 1207 Fidelity Bldg., Tacoma, Washington, as Medical Ward Officer.

1st Lieutenant Francis E. Shovlain, Western State Hospital, Ft. Steilacoom, Washington, as Medical Ward Officer.

2nd Lieutenant Carroll H. Durkee, MA-Res., Box No. 212, Philipsburg, Montana, assigned to 66th Surgical Hospital, 3rd Army, as Registrar and Commanding Officer Detachment of Patients.

Major Oscar Yarnell, Med-Res., 708 No. 38th St., Seattle, Washington, relieved from assignment to General Hospital No. 35, Communications Zone, and reassigned to General Hospital No. 50, Communications Zone, as Chief of Laboratory Service.

Capt. Andrew O. Otteraaen, Med-Res., 1104 Dexter-Horton Bldg., Seattle, Washington, assigned to 425th Hospital Company, 349th Medical Regiment, IX Corps, as Receiving Officer.

By direction of the President, and under authority contained in letter from The Adjutant General, dated November 28, 1924, Subject: Training Year, 1925, and General Orders, No. 35, War Department, November 28, 1924, the following-named reserve officers are ordered to active duty for training effective June 13, 1926. On that date each reserve officer named herein will proceed without delay to Camp Lewis, Washington, and upon arrival thereat will report in person to the Commanding General thereof for training.

Each officer will rank from the date specified after his name:

Colonel Marius Breckenridge Marcellus, 0-146230 Med-Res., 615 East Broadway, Portland, Oregon, June 13, 1926.

Major Albert Caine Morrow, 0-191671, Vet-Res., 325 South Rife St., Dillon, Montana, June 13, 1926.

Captain Horst Schreck, 0-202678, Vet-Res., 13th and Couch Sts., Portland, Oregon, June 13, 1926.

First Lieutenant Frank Joseph Streibig, Jr., 0-206158, MA-Res., 710 East 22, North Portland, Oregon, June 13, 1926.

Captain Johnson, Frank Ditto, 0-218953, Med-Res., P. O. Box 66, Rainier, Oregon, June 13, 1926.

The following named reserve officers are ordered to active duty effective July 4, 1926. On that date each reserve officer named herein will proceed without delay to Camp Lewis, Wash., and, upon arrival thereat will report in person to the commanding general thereof, for training.

Colonel David Connolly Hall, 0-152253, Med-Res., University of Washington, Seattle, Wash., June 19, 1926.

Lieut. Col. Vestal Raul Abraham, 0-140771, Med-Res., Butler Bank Bldg., Hood River, Ore., July 4, 1926.

By direction of the President, and under authority contained in letter from The Adjutant General, dated November 28, 1924, Subject: Training Year 1925, and General Orders No. 35, War Department, November 28, 1924, Colonel Herbert Merton Greene, 0-140630, Medical Department Reserve, 830 Medical Arts Bldg., Portland, Oregon, is ordered to active duty effective June 16, 1926. On that date he will proceed without delay to Vancouver Barracks, Washington, and, upon arrival thereat, will report in person to the Commanding General thereof for training. He will rank from June 16, 1926. If not sooner relieved from active duty, he will be returned to his home so as to arrive thereat on June 30, 1926, upon which date he will stand relieved from further active duty.

Captain Roscoe L. Ghering, 0-194246, Medical Department Reserve, 204 Peyton Bldg., Spokane, Washington, is ordered to active duty effective June 16, 1926. On that date he will proceed without delay to Fort Geo. Wright, Washington, and, upon arrival thereat will report in person to the Commanding Officer thereof for training. He will rank from June 16, 1926. If not sooner relieved from active duty, he will be returned to his home so as to arrive thereat on June 30, 1926, upon which date he will stand relieved from further active duty.

Major Merle Simpson Harmon, 0-189797, Medical Department Reserve, 7212 Woodlawn Ave., Seattle, Washington, is ordered to active duty effective June 12, 1926. On that date he will proceed without delay to Camp Murray, Washington, and upon arrival thereat will report in person to the Commanding Officer thereof for training with a unit of the Medical Department, Washington National Guard. He will rank from March 15, 1926. If not sooner relieved from active duty, he will be returned to his home so as to arrive thereat on June 26, 1926, upon which date he stands relieved from further active duty.

Major John Maurice Henderson, 0-102899, Medical Department Reserve, 216 Cobb Building, Seattle, Washington, is ordered to active duty effective June 12, 1926. On that date he will proceed without delay to Camp Murray, Washington, and upon arrival thereat will report in person to the Commanding Officer thereof for training with the 146th Field Artillery, Washington National Guard. He will rank from June 12, 1926. If not sooner relieved from active duty, he will be returned to his home so as to arrive thereat on June 26, 1926, upon which date he will stand relieved from further active duty.

By direction of the President, so much of Par graph 19, Special Orders No. 118, these headquarters dated May 26, 1926, as orders Major William Edwin Joiner, 0-155494, Med-Res., 1929 First Ave. W., Seattle, Washington, to active duty effective June 12, 1926, and relieves him therefrom on June 26, 1926, is hereby amended to read, to active duty effective June 16, 1926, and relieve him therefrom on June 30, 1926.

REPORTS OF SOCIETY MEETINGS

PACIFIC COAST OTO-OPTHALMOLOGICAL SOCIETY

The Fourteenth Annual Meeting of Pacific Coast Oto-Ophthalmological Society was held at San Francisco, Calif., April 26-28.

Herewith are presented abstracts of the papers read before the meeting.

INTRAOCULAR GROWTHS IN CHILDREN

THE PROBLEMS OF DIAGNOSIS

Frederick A. Kiehle, A. B., M. D.
Portland, Ore.

This paper presents in detail three cases illustrating some of the problems met with in determining the procedure in the presence of an abnormal intraocular picture in children.

A resume follows of the conditions more commonly confused with glioma. The author stresses the rime importance, coupled with the difficulty of distinguishing early between glioma and other conditions that resemble glioma but that are innocuous, and emphasizes the necessity for prompt enucleation where there is even a suspicion of malignancy.

PARACUSIS

Vern O. Knudsen, Ph. D., Department of Physics,
University of California, Southern Branch
and
Isaac H. Jones, M. D., Los Angeles.

The writers have conducted experiments to determine whether certain individuals with impaired hearing hear better in the presence of a noise. Two methods of approach: first, determining the effect of noise upon the acuity of hearing of pure tones; second, determining the interfering effect of noise upon the hearing of speech-sounds. This latter method also was employed to determine the interfering effect of pure tones upon the hearing of speech-sounds. Of a series of 187 cases studied with the audio-amplifier, certain typical cases were selected for special study—ten "paracusics" and two "perceptives." In addition, tests were conducted upon three "normals."

Results of experiments: A noise diminishes the acuity of hearing of pure tones, for all individuals. The "paracusic" is no exception. A noise also interferes with the hearing of speech-sounds for all individuals. Here again the "paracusic" is no exception.

Summary: Paracusis is found only in the individual with a hearing impairment of the conductive type. A noise impairs the hearing of everybody, irrespective of the degree of hearing or the nature of the hearing defect. The reason that certain patients think that they hear better in the presence of a noise are: (1) the noise is not so disturbing to an individual with conductive impairment as it is for all other individuals; (2) the "paracusic" has his best hearing acuity for those frequencies which are the most important for the hearing of speech, and he also has his poorest acuity for those frequencies which are most disturbing to the hearing of speech: (3) a normal individual always speaks louder in the presence of a noise because he hears the noise, whereas the "paracusic" does not speak so loudly because he is not so much disturbed by the noise. Also, because of his conductive defect, the "paracusic" hears his own voice relatively loud, and consequently lowers his voice. For these reasons, in the presence of a noise, a "paracusic" is at a relative advantage compared to the normal. However, there is no evidence whatever that any type or degree of noise actually increases the acuity of hearing of the "paracusic."

DENTAL OSTEITIS AND MAXILLARY SINUSITIS

Frank A. Burton, M. D.
San Diego, Calif.

Dental osteitis and necrosis more common complications of maxillary sinusitis than ordinarily supposed. Quite a percentage of stubborn chronic maxillaries are due to dental osteitis. In such cases, root disease is primary condition. Often difficult to establish relationship between previously extracted diseased teeth and present complaint. Recommends thorough curettage of alveolus when diseased tooth is extracted. Complaints differ from almost nil to marked swelling, tenderness, pain. Where fistula, pus discharge, bad taste are present, thorough x-ray study is often necessary. Careful clinical history is important first step. Sometimes alveolus closes below and osteitis continues in direction of maxillary sinus. Diagnosis is necessary to cure, failure in diagnosis being likely to occur unless looking for complication.

Dr. Joseph L. McCool reported a case of infected marginal ulceration in a woman past fifty years of age, which resisted all forms of conservative treatment and cauterization with trichloracetic acid. The ulcer nearly encircled the cornea. A conjunctivoplasty was performed, covering the ulcer above and below. This procedure was entirely effective. Calcium lactate and parathyroid were used internally. Ultimate vision was 20/25.

THE RELATION BETWEEN AUDITION AND THE CIRCULATION OF THE BLOOD IN THE HEAD

Harmeton Stillson, M. D.
Seattle, Wash.

Certain peculiarities obtain in the circulation of the head. Within the cavum the walls of the vessels are extremely thin; the diameter of the vessels is large; the volume of blood remains practically constant, increase or decrease of the functional activities within the cavum being taken care of by the increase or decrease of the rate of the flow of the blood through the vessels.

The circulation is unique, also, in being influenced by the amount of cerebrospinal fluid within the ventricles. And since the floor and lateral walls of the fourth ventricle can be regarded as the primary terminal station of the vestibular nerve, any increase or decrease in the pressure of the cerebrospinal fluid within the ventricle can disturb hearing. This fluid is also in relation to the fluid within the inner ear, and since the pressure of the cerebrospinal fluid can be made to vary with postural changes, compression of the neck vessels, etc., can be made to affect the hearing. Hence, the influences of hydrostatics, barometric changes, thermal and chemical changes, etc., have especial influence upon the hearing.

From the fact that a part of the ear mechanism depends upon air vibrations for its functioning, disturbances of the aerostatic equilibrium in that part of the ear affects the hearing peculiarly. So, too, does disturbance of the various "complements" in the circulation. The complement between the vagotonus and the sympatheticotonus, the complement between the splanchnic and the cerebral circulation call for especial mention.

So that practically all the forces of nature come into play in the operations of the organ of audition. Arteriosclerosis, the various reflexes, emotional stress, toxic poisoning, dietitic errors, improper modes of living, of working, etc., all contribute.

Hence, anemia will give progressive and permanent deafness. As a rule increasing the amount of blood in the head will increase the acuity of audition within physiologic limits and decreasing the amount will decrease the hearing, but prolonged increase or decrease will destroy the hearing.

Dr. Cunningham reported having had twenty-six nonmalignant strictures of the esophagus. Sixteen were due to drinking lye, one to drinking nitric acid. Four at the level of cricoid, and one at the hiatus were of unknown cicatricial origin. Three congenital strictures at the hiatus and one congenital atresia at level of the bronchus. He had twenty-eight cases of functional stenosis. Fourteen were spasms of psychic origin, four at the hiatus due to ulcers simulating cardiospasm. Ten were cases of true functional stenosis at the hiatus (commonly called cardiospasm) the youngest being four and one-half years of age.

He also reported sixty-one cases of foreign bodies impacted below the level of the pharynx. Several cases were reported in detail; among them was the recovery of a child from mediastinitis due to a false passage of an esophagoscope, extending from pyriform sinus to the diaphragm; also, an abscess of the midiastinum which caused stenosis of the trachea, with unusual involvement of the laryngeal nerves. Both abductors and both internal tensors were paralyzed with the escape of both abductors.

THE CURE OF CHRONIC SUPPURATIVE NASAL CONDITIONS BY DRAINAGE THROUGH THE MAXILLARY ANTRUMS

Fred Stauffer, M. D.
Salt Lake City, Utah

Paper deals with the importance of correct diagnosis, including x-ray. Causation of chronic nasal discharges is repeated clods in the head, first effecting the ethmoidal cells, then involves most frequently the antrums from their dependent position and poor drainage. Attention is drawn to the causative effect of deflections and exostosis from the nasal septum, interfering with the drainage from the accessary sinuses. Recent experience has shown that infected antrums are more frequently the cause of chronic suppurations from the nose than formerly was believed.

The paper stresses the importance of first establishing good ventilation and drainage by correcting abnormalities of the septum; and, second, drainage of the antrums by a Caldwell-Luc operation which not only drains the antrums but often cures mucous polypi and suppurations in the ethmoids because of drainage from below.

Numerous lantern slides were shown to stress the advantages of the operation through the canine fossa in preference to any of the internal operations. This method was not put forth as a panacea for all chronic nasal discharges, but it is claimed that many cases subject to chronic suppurative ethmoiditis with polypus formation can be cured by this method which are not amendable to other forms of treatment.

THE ROLE OF THE OPHTHALMOLOGIST AND OTORHINOLARYNGOLOGIST IN THE DIAGNOSIS OF DUCTLESS GLAND DISEASE

H. Lisser, M. D.
San Francisco, Calif.

It is important to develop the "prepared-open-mind" toward this subject; in other words, to be neither ignorantly credulous nor cynically intolerant. It is possible that such diseases as cataract, glaucoma, retinitis pigmentosa, kerataconus, retinal hemorrhages and detachment of the retina, blue sclera, vasomotor rhinitis, hay fever and otosclerosis may be directly or indirectly related to derangements of endocrine function, but in none of these conditions has an incretory origin or participation been convincingly established. The action of a hormone such as adrenalin, in reducing intraocular tension in glaucoma or in cutting short an attack of asthma, is probably pharmacodynamic and is not to be construed as supplementing a temporary adrenal insufficiency. Therapeutic conclusions whether positive or negative will have more significance when extracts of adrenal cortex, ovary, testicle and anterior hypophysis reach the same potency and reliability as insulin, adrenalin (from the adrenal medulla), pituitrin (from the posterior hypophysis), thyroid extracts and Collip's parathyroid extract.

Most will recognize that endocrine syndromes present important manifestations of glandular dysfunction in the realm of the eye, ear, nose and throat. This was demonstrated by showing pictures of acromegaly, gigantism, hypophyseal infantilism, postadolescent hypopituitarism, Larence-Moon-Biedl syndrome, Christian's syndrome, tetany, diabetes mellitus, Addison's disease, virilismus, eunchoidism, exophthalmic goiter, adenomatous goiter with intrathoracic extension, childhood and adult myxedema, endemic cretinism and mongolism. Some of the complaints in these endocrinopathies are of such a character as to induce the patient to seek the specialist without realizing that the symptoms in his eyes, ears, nose and throat are due to profound disturbances originating elsewhere in the body, and it will then be the province of the specialist to recognize this fact and prescribe appropriate therapy or refer the patient to an internist qualified in endocrine diagnosis.

It is desirable that future contributions to thi field strive to separate fact from fancy. They should state frankly which of their conclusions were de rived from bedside observation or laboratory experiment and which of them emanated from a "projective imagination."

Dr. Walter Hoffman reported seven cases of paresis of convergence, unaccompanied by a paresis of accommodation or any other ocular muscle, all secondary to epidemic encephalitis lethargica. The condition could probably be more properly termed a suppression of convergence, rather than a paresis, as there was no paresis of the internal recti or any other ocular muscle.

CHANGES IN THE REFRACTION IN DIABETES MELLITUS HYPEROPIA

A. B. Dykeman, M. D.
Portland, Ore.

The onset of hyperopia during the course of diabetes is a not infrequent occurrence, and is no doubt becoming more frequent since the introduction of insulin as a means of therapy in this disease. The condition occurs, as a rule, with a rapid reduction in the blood sugar content, and as the blood sugar approaches the normal and is kept there by diet and insulin therapy. The hyperopia diminishes in amount and the refraction tends to return to the state in which it was, preceding the onset of the hyperopia.

The many theories advanced for the production of the phenomenon are discussed and the chief emphasis is laid on the theory of lenticular changes, as advanced by Duke-Elder. The lenticular changes are dependent on the disturbances in the water balance of the body, the changes in the lens being brought about by osmotic forces. Four cases of the condition were reported.

Drs. C. A. Veasey and C. A. Veasey, Jr., of Spokane, reported a case of unusually large carcinoma of the left orbit in a male farmer, age 75 years, which had evidently appeared at the site of a former papilloma. The growth was so large that it completely filled the orbit, was connected with a tumor mass in the upper lid and completely surrounded the eye ball, excepting a very tiny portion of the cornea in which the iris had become incarcerated. The eyeball was firmly imbedded in the tumor mass and was so compressed that its shape was changed. It was removed by exenteration and radium was employed, 100 milligrams screened with 1½ millimeters of brass and rubber being placed as near the central portion of the orbital cavity as possible and kept in situ for seven hours.

The question of the literature of orbital carcinoma and possible perforation of the eyeball was discussed.

BRONCHOSCOPIC STUDIES OF SOME CONDITIONS OF THE RESPIRATORY TRACT

Dr. Simon Jesberg, M. D.
Los Angeles, Calif.

Modern bronchoscopy is being more concerned with conditions other than removal of foreign bodies. In a fiscal year at the bronchoscopic clinic of the Eye & Ear Hospital of Los Angeles, there were 341 endoscopic examinations and treatments of which only 13 were foreign bodies.

X-ray signs of air trapping were described; partial air trapping in minor degrees of obstruction of a bronchus is better detected by the fluoroscope than by roentgenogram.

Report of two cases of foreign body in the bronchi with slight obstruction, diagnosis of partial air trapping was made with the fluoroscope.

Report of eleven cases of various conditions of bronchial obstruction:

1. Obstruction of left bronchus by a polyp after pertussis.

2. Obstruction of bronchus by tuberculous mediastinal gland.

3. Bronchial obstruction, with air trapping left lung, in an infant with large thymus.

4. Obstruction of right bronchus by swollen mucosa and pressure, a foreign body being in the left bronchus.

5. Obstruction of left bronchus, due to tuberculous granuloma (lupus) of trachea.

6. Obstruction of air passages by viscid secretions during chickenpox.

7. Obstruction of bronchus and collapse of right lung during bronchopneumonia.

8. Partial obstruction of left bronchus, due to pericarditis.

9. Tracheobronchial obstruction, due to diphtheria.

10. Atelectasis of new born.

11. Spontaneous pneumothorax in two year old child, simulating foreign body.

Dr. Will Otto Bell, Seattle, discussed the slit-lamp, bringing out not only some of the opportunities and more practical ways of using the lamp, but showing some of the practical ways to which it could be put.

ADENOIDS IN ADULTS

Wilson Johnston, M. D.
Portland, Ore.

In reviewing the literature the author finds that from twenty-five to thirty per cent of the malignancies of the nasopharynx have been operated upon for the removal of tonsils and adenoids within from one year to three weeks previous to a diagnosis of malignancy being made. From these statistics he believes that in the early stage of malignancy in a percentage of cases, there is an enlargement of the tissues at the site of the pharyngeal tonsil which resembles adenoid tissue.

He reports four types of cases:

1. Sarcoma of the nasopharynx complicated by Vincent's angina, in which a diagnosis was made by excision of gland from the neck.
2. Recurrent adenoid in a patient, age twenty-five.
3. Carcinoma of the nasopharynx with a smooth enlargement in the midline.
4. Young adult with persistent adenoid growth.

It is to the latter type of cases that the author wishes to call attention, in that they may receive more careful consideration. If treated surgically, the removed tissue should be submitted to microscopic examination. He believes in and advises the treatment of these patients with radium, and exhibited a method of application and screening.

SOME EUROPEAN EYE CLINICS ON THE EVE OF THE GREAT WAR

Dr. George W. Jean, M. D.
Santa Barbara, Calif.

Early in 1914 several European eye clinics were visited by the writer. The clinics at Berne, Zurich and Basel in Switzerland; Freiburg, Heidelberg, Wurzburg, Erlangen, Munich and Breslau in Germany were visited. Description of equipment, operative technic, preparatory and after treatment and nonpersonal opinions were recorded. Operative procedures in glaucoma, cataract, magnet extraction and other conditioins were noted with care.

AMPUTATION OF ANTERIOR HALF OF INFERIOR TURBINATE, WITH PORTION OF INNER WALL OF NASAL DUCT, FOR RELIEF OF STILLICIDIUM AND DACRYOCYSTITIS

Frank W. Helscher, M.D.
Long Beach, Calif.

After criticism of the prevailing methods, the author declares that obstruction to the lachrymonasal duct from malposition of the lower turbinate body against the outer wall, to be the usual cause of epiphoria and dacryocystitis, and therefore should be corrected before any permanent effect can be expected.

Fracture of this body and reattachment in its proper position towards the septum should be done, if there is space enough to get good ventilation in the meatus in the vicinity of the outlet of the duct, otherwise the anterior half of the turbinate should be amputated. In doing this we should as a rule cut very close to the outer wall of the bony wall, which greatly facilitates the passage of the sound. Amplification by extension of this dissection can easily be accomplished when thought necessary to whatever extent desired. A slight dehisence or a large one in the bony wall, removing the inner half of the nasal duct, or even making a new opening in the lower end of the lachrymal sac, keeping this open by the familiar drainwick pulled in from below.

The paper is mostly critical and considers the various indications for interference.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., W. C. Woodward; Secty., O. H. Christoffersen

The medical section of King County Medical Society, Seattle, Wash., held a meeting in the Assembly room of Medical and Dental Building June 18, with President Woodward in the chair, who turned over the meeting to Dr. Lester Palmer, chairman of the medical section. There was an attendance of about 250 members of the society and of the laity. The society was honored by the presence of a group of distinguished visitors.

The first address was by Dr. William J. Mayo, "Newer Problems in Cancer." He spoke of the association of the higher intellectual faculties with the eye. He referred to the development of cellular pathology by Virchow and Pasteur, from which dates the beginning of our knowledge of cancer. The first studies focused attention on the nucleus. By newer methods of staining a differentiation of the cytoplasm of the cell may be observed. The Mayo Clinic recognizes four groups of malignancy. Following the use of x-ray and radium, the position in this group may be altered. The infectious aspect of the problem was discussed. Reference was made to the actual cautery and electric cautery in the removal of malignancy. The importance of irritation as an etiologic factor was mentioned. There must be natural immunity, since some individuals subject to chronic irritation do not develop cancer, while others do so when subject to a short period of irritation. The soil on which cancer grows is an important factor. There must be some way of modifying this as we do smallpox or diphtheria.

The second address was by Dr. R. C. Coffey, of Portland, on "The General Principles of Treatment of Pulmonary Tuberculosis." He emphasized the importance of local rest, with the aid of surgical means to produce this result, whether it be located in lungs, intestines or joints. In intestinal tuberculosis this result may be obtained by short-circuiting.

The third address was by Dr. D. C. Balfour, of the Mayo Clinic, on "The Management of Pathologic Conditions in the Stomach and Duodenum." Certain physiologic aspects of the stomach and duodenum have not been explained. Such knowledge may be secured by surgical procedures. Many chronic diseases are due to persistence of abnormal function. Little is known as to the cause of ulcer. The most common finding in peptic ulcer is hyperacidity. Healing may be produced by a change in the habits of living. Radical operation of duodenal ulcer is not considered good treatment. In chronic gastric ulcer partial gastrectomy is advised because of the tendency towards malignancy. These addresses were discussed by Drs. Eagleson, Slyfield and Mason.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. F. Dodd; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held May 25, 1926, at 8 p. m., at the United States Veterans' Hospital, No. 94, American Lake. Dr. H. E. St. Antoine, the officer in charge, with his associates, led in a complete inspection of the buildings and gronds, after which the society met in the assembly room of the nurses' home.

Minutes of the previous meeting read and approved. The transfer of Dr. H. Kurata from King County Medical Society was accepted. Announcement was made of the graduating exercises of the Tacoma General and St. Joseph's Hospitals.

Dr. Murphy gave a report on the insurance proposition. After discussion, Dr. Willard moved that the proposed plan of insurance be approved by the society, that the Pierce County Medical Society Library Fund be made the beneficiary to the extent of $500.00 on each policy, and that a committee of ten be appointed to canvass the society for names of those wishing to take out insurance. The motion was carried unanimously. The following committee was appointed: Dr. Murphy, chairman; Drs. Hopkins, Engels, MacLean, Hards, Jonez, Yoder, Doe, Crowe and Bridge.

The following program was then presented by the hospital staff:

A discussion of the type of patients admitted to the hospital and methods of admission, by Dr. A. C. Stewart.

Ventriculography as it has been applied to cases in this hospital, with numerous slides, Dr. D. G. Dickerson. This paper was discussed by Dr. George Swift of Seattle.

Motion was made and carried that a unanimous vote of thanks be extended to Dr. St. Antoine and his staff for their splendid reception and program.

The society then moved to the dining room, where refreshments were served.

WHITMAN COUNTY MEDICAL SOCIETY

Pres., D. T. Ford; Secty., F. E. Preucel

Whitman County Medical Society held a meeting and banquet Monday, June 14, at the Hotel Commercial, Colfax.

An enjoyable evening was spent by the physicians and their wives. Dr. E. N. Layton provided music and Dr. W. A. Mitchell, as toastmaster, coaxed some very interesting "short talks" out of the members of the society. After the banquet, the women were entertained at the Rose Theatre, and the society held a regular quarterly meeting.

Beside the usual business, and an instructive talk by Dr. F. A. Bryant, who has just returned from a trip East, and made useful observations at Rochester and other medical centers, the society created a "Public Health Advisory Board." The board was appointed by president D. T. Ford, and consists of the following members: E. N. Layton, J. Edward Preucel of Colfax and Dr. Kimzey of Pullman.

The function of said board will be

1. To keep the public informed, through the press and by other honorable means, on matters pertaining to progress of medicine and preventive medicine.

2. To enlighten the public, as near as possible, on the "need of medical legislation."

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Medical Diagnosis. For the Practitioner and Student. By Charles Lyman Greene, M. D. Formerly Professor of Medicine and Chief of Medical Clinic, University of Minnesota, etc. Sixth Edition and Enlarged with 723 Illustrations and Colored Plates. 1468 pp. $12.00, Cloth. P. Blakiston's Son and Co. Philadelphia, 1926.

In this latest edition many additions have been made, including a section on basal metabolism and much new matter on the heart with a fine series of polygrams and electrocardiograms. The work as a whole is rather unequal in its completeness. For instance, there are nearly 400 pages on the heart and about 175 pages each are devoted to consideration of diseases of the digestive organs and lungs. Again, 34 pages are given to the discussion of the "drop heart," and but 15 to all diseases of the liver and biliary passages.

The author is recognized as the chief exponent of the "drop heart," and its importance is great, much as is enteroptosis in Stiller's universal congenital asthenia, of which it is another evidence. The numerous polygrams and electrocardiograms to illustrate almost all common cardiac disorders may be desirable, because these belong to the newer methods of precision in diagnosis. But so is the use of the dye in x-ray diagnosis of the gallbladder, and to this the writer devotes three whole lines, in which he states it "is not yet practical as an office procedure, and should be reserved for selected cases of unusual difficulty." With this the reviewer wholly disagrees, as the dye may be given intravenously or in pills at home in the evening, and the patient appear at the office next day for x-ray examination. Most space is devoted to x-ray examination of the gallbladder, minus the dye.

While the section on the heart is by far the most comprehensive, yet no classification of heart disorders is given, and the etiologic factors are but lightly touched on. Diagnosis is aided much by knowing the cause of the more common cardiac diseases, as congenital, streptococcic, goitrous, hypertensive, syphlitic and arterioclerotic cardiopathies. Moreover, the term myocarditis is frequently used but no means by which we may diagnose this lesion are supplied, because its diagnosis is impossible. Nor is much space given to this by far the commonest of all heart lesions in those of middle and advanced life, this very so-called chronic myocarditis. The distinction should have been drawn between the myocardial weakness or insufficiency we can detect, and the true fibrous myocarditis which can only be certainly diagnosed by autopsy.

The book is not particularly strong in differential diagnosis. For instance, under diagnosis of atrophic portal cirrhosis it is not noted that much difficulty is sometimes experienced in distinguishing cirrhosis of the liver from carcinomatous peritonitis, from the ascites seen in adhesive pericarditis, and syphilis of the liver. Again, in the diagnosis of acute poliomyelitis no mention is made of the common trouble that one has in discriminating between epidemic poliomyelitis and encephalitis. Several general comments are made about diseases which are of great value, such as gallbladder and bile duct disease "are the only abdominal conditions which are underdiagnosed at the present time," and "all intractable dyspepsias coming on after middle age, after preceding immunity, should suggest cardiovascular disease, gallstones or carcinoma." In conclusion, we would say that, if the author fails, it is not in having too much heart, and this is infinitely preferable to having too little. The book as a whole contains an enormous amount of well digested material and deserves its notable popularity and success. WINSLOW.

BLOOD CHEMISTRY COLORIMETRIC METHODS. For the General Practitioner with Clinical Comments and Dietary Suggestions. By Willard J. Stone, B. Sc., M. D., Attending Physician, Los Angeles, General Hospital and Pasadena Hospital. Second Edition Revised. 129 pp. $3.25. Paul B. Hoeber, Inc., New York, 1926.

This work is a compilation of laboratory methods established for the determination of nonprotein nitrogen, urea nitrogen, uric acid, preformed creatinin, total creatinin, sugar and chlorides in the blood. They are largely the methods of Folin and Wu, modified slightly for the convenience of a small laboratory. At the end of each chapter there is a discussion of the clinical significance of these various tests. This closing comment of clinical significance is exceedingly valuable, for it enables the clinician to correlate the chemical finding with the clinical entity. The author shows a broad clinical experience in the applicaton of these tests. The closng paragraphs of the book deal in a brief manner with the dietary control of disturbances of metabolism, making the application principally to nephritis and diabetes. For one who wishes to correlate laboratory findings with clinical experience, and outline therapy in a rational manner, no book could be more helpful. HOFRICHTER.

DIATHERMY WITH SPECIAL REFERENCE TO PNEUMONIA. By Harry Eaton Stewart, M. D., formerly attending Specialist in Physiotherapy U. S. Marine Hospitals, New York, etc. With 45 Illustrations and 15 Charts. Second Edition, Revised. 220 pp. $3.00. Paul B. Hoeber, Inc., New York, 1926.

The greater part of this volume is devoted to a description of diathermy, particular attention being paid to technic and the treatment of special conditions. Beside its medical application there is a brief description of surgical diathermy. The author has had special experience in the application of this form of treatment to pneumonia, being one of the first to report its successful use. He includes reports of a large number of cases treated both by himself and other physicians. They are unanimous in the conclusions as to its efficacy. It produces a reduction of temperature, pulse, respiration and cyanosis, while the mortality of patients thus treated is about half of that from other methods. This volume is evidence that this has become an established method of treating all forms of pneumonia.

EDGAR'S PRACTICE OF OBSTETRICS. For Students and Practitioners of Medicine. By J. Clifton Edgar, Emeritus Professor of Obstetrics and Clinical Midwifery in the Cornell University Medical College, etc. Revised by Norris W. Vaux, Clinical Professor of Obstetrics in the Jefferson Medical College and to the Jefferson Hospital, Philadelphia, etc. Sixth Edition, With 684 Illustrations, including 5 Colored Plates and 38 Figures, Printed in Colors. 779 pp. $8.00. P. Blakiston's Son & Co., Philadelphia, 1926.

This has been a standard text book for a number of years as a good, practical treatise on obstetrics. As Dr. Edgar has given up the actual teaching of obstetrics, this edition has been revised by Dr. Vaux. The text is as concise as possible from a clinical standpoint, and as a result it is most suitable as a text book. Special stress has been laid on the prenatal care and the conduct of labor. Due attention has been given to the latest methods of obstetric anesthesia. The Gwathmey technic is explained in detail. This edition will be of distinct advantage not only to the student but to the practitioner as well as a handy reference work. C. D. SHANNON.

A TEXT-BOOK OF UROLOGY. By Oswald Swinney Lowsley, A. B., M. D., F. A. C. S. Director of the Department of Urology of the New York Hospital, etc., and Thomas Joseph Kirwin, Ph. C., B. S., M. A., M. D., Chief of Clinic of the Department of Urology, New York Hospital. Illustrated with 233 Engravings and 13 Plates. 699 pp. $10.00. Lea & Febiger, Philadelphia and New York, 1926.

From the text of this book it is self-evident that the writing is based on very extensive laboratory research and clinical experience. The text is clear and concise, conveying to its reader definite information. All of the diagnostic procedures are fully described; the various methods of treatment are set forth. The chapters on cystoscopic and operative surgery are especially well illustrated, in most instances showing each consecutive step of the procedures.

The reviewer, having had the opportunity of using one of Dr. Lowsley's operating cystoscopes, which is one of the wonders in urologic armamentarium, was particularly interested in the description of this instrument and its performance. The subject of anesthesia, which is so important to every practitioner doing work on the urogenital tract, has been given due consideration from these master minds who have done so much original work in regional anesthesia. O. A. NELSON.

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Nervous and Mental Disorders. From birth through adolescence. By B. Sachs, M. D. Consulting Neurologist to the Montefiore Hospitals, etc. and Louis Hausman, M. O., Instuctor in Neuro-Anatomy, Cornell University Medical College, etc. 110 illustrations including 3 full page plates (one in color). 861 pp. $10. Paul B. Hoefer, Inc., New York. 1926.

This is not a revision of Dr. Sachs' book on the nervous diseases of children, but is a new work which includes much of the former volume and carries the subject further than the old one. It has many new chapters and is quite complete in its general arrangement. The chapter on the normal child and the normal youth is quite unusual in a book dealing with abnormal conditions.

Dr. Hausman's association with this volume has furnished splendid chapters on anatomy which make it much more complete than the usual work on nervous and mental diseases. The articles on each disease are quite concise, so that the average man is not bored by a long and tedious description and history. The authors furnish complete bibliographs at the end of each chapter so the reader may know where to continue the study of the subject, if he wishes to do so. This book should prove of value to the general practitioner as well as to the man limiting his work to nervous and mental diseases. Nicholson.

Emergency Surgery. The Military Surgery of the World War adapted to Civil Life. By George de Tarnowsky, M. D., F. A. C. S., D. S. M., Col. M. C., D. R. C. (378th Medical Regt.) Professor of Clinical Surgery, Loyola Medical School, etc. Illustrated with 324 engravings. 718 pp. $7.50. Lea & Febiger, Philadelphia and New York, 1926.

This is a very refreshing and interesting book. It has been the purpose of the author to set down his own and other surgeons' experiences in the treatment of wounds during the world war, and to apply the methods which were found to be the most useful to civilian practice as seen in industrial and traumatic surgery. As the author states in the preface, "industrial surgery is merely war surgery on a small scale." The author has eliminated controversy and describes thoroughly and concisely the treatment of burns, wounds, fractures and nerve injuries. Physiotherapeutic measures are purposely omitted, as they lack standardization. However, seventy-five pages are devoted to the medicolegal aspect of emergency surgery.

Tincture of iodine is still recommended as the best antiseptic for use as a first aid application. Ether is also very highly praised. Forbes.

Nursery Guide for Mothers and Children's Nurses. By Louis W. Sauer, Ph. D., M. D., Senior Attending Pediatrician, Evanston Hospital. Second Edition. 206 pp. $2.00. The C. V. Mosby Company, St. Louis, 1926.

The purpose of this book is to give aid to those to whom are intrusted the care and feeding of infants. Many useful suggestions are offered for the proper care in raising of children. A useful chapter deals with "some common ailments." Suggestions are given as to diagnosis and simple treatment, but the wise injunction is imparted, early to consult your physician.

Abt's Pediatrics. By 150 specialists. Edited by Isaac A. Abt, M. D., Professor of Diseases of Children, Northwestern University Medical School, Chicago. Set complete in eight octave volumes totaling 8000 pages with 1500 illustrations, and separate Index Volume free. Now ready—Volume VIII containing 1102 pages with 388 illustrations and General Index to Volumes I to VIII. Philadelphia and London: W. B. Saunders Company, 1926. Cloth, $10.00 per volume. Sold by subscription.

The topics in this volume are treated with the same thoroughness of details as those in the preceding volumes, while the wealth of illustration, gross and microscopic, adds to their value for quick study and reference. It is unfortunate that the illustrations for the section on skin diseases are not done in color, since most often the diagnosis in these conditions depends on having or not having a memory picture.

In the chapter on hospitals for infants and children, no apparent detail of architecture, construction, administration, organization and management has been omitted. Numerous architect's plans are included. The section on medicolegal questions describes postmortem examination, determination of maturity of fetus, viability and infanticide methods. The common causes of sudden death in children are discussed with completeness, and the needed caution given of not making a too hasty diagnosis of "thymic death." Valuable statistics are given as to the frequency, age, incidence and methods of suicide among children. This book adds another volume to the most complete and modern addition to pediatric literature. McCown.

The Clinical Interpretation of The Wassermann Reaction. By Robert A. Kilduffe, A. B., A. M., M. D. Director, Laboratories, Atlantic City Hospital, etc. Illustrated. 203 pp. $2.50. Lea & Febiger, Philadelphia and New York, 1926.

This work, if read and followed, will do much to help the practitioner to correlate the serologic reactions with the clinical findings. A chapter is devoted to conditions, other than syphilis, that may give a false positive. The author also brings out the fact that patients with an active neurosyphilis may show a negative spinal fluid under certain conditions. This book should prove particularly valuable to the general practictioner in the elucidation of his every-day problems of handling luetic patients.

O. A. Nelson.

A Manual of Normal Physical Signs. By Wyndham B. Blanton, B. A., M. A., M. D., Richmond, Virginia. Associate in Medicine, Medical College of Virginia. 215 pp. $2.50. The C. V. Mosby Company, St. Louis, 1926.

Most text books on physical diagnosis stress pathologic signs, sometimes to the extent of minimizing the normal. The purpose of this volume is to accentuate normal physical signs. There are chapters on sound, inspection, palpation, percussion and auscultation, in which the details are given for the application of each of these methods. Different organs are considered and the normal physical signs of each are explained.

NORTHWEST MEDICINE

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ORIGINAL CONTRIBUTIONS

THE RELATION OF THE GASTROINTESTINAL TRACT TO PERNICIOUS ANEMIA[*]

A. C. Ivy, M.S., Ph.D., M.D.
CHICAGO, ILL.

From the Department of
Physiology and Pharmacology
Northwestern University Medical School

Much evidence has been advanced in recent years that strongly suggests that the gastrointestinal tract is significantly related to anemia, especially pernicious anemia. It is difficult, however, to say whether the gastrointestinal findings are cause or effect. In this paper I desire briefly to review the evidence that argues for a casual relationship between the gastrointestinal tract and anemia.

The Role of the Gastrointestinal Tract in the Metabolism of Iron. It is well known that a complete history of the metabolism of iron in the body is lacking. Several facts seem to be established. (1) The body exercises a strict conservation of its supply of iron. (2) The upper intestine is concerned chiefly in the absorption of iron and the lower portion of the intestine is concerned in its excretion. (3) Practically no iron is excreted in the urine normally. (4) Iron is absorbed in either organic or inorganic form. (5) Its synthesis to hemoglobin takes place in the red bone marrow. (6) The pyrrole ring, the basic structure of hemoglobin, must be taken in the food as the body cannot apparently synthesize it.

It is well known that iron salts are soluble in dilute acid solutions, but are insoluble in alkaline solutions. Therefore, it has been argued that the HCl of the gastric juice dissolves the iron salts and renders them more readily absorbed in the upper intestine. It has been objected that the contents of the upper intestine are only slightly acid or may be slightly alkaline. But Sahli[1] has answered this objection by pointing out that carbonic acid can hold iron salts in solution and that alkaline chalybeate waters contain iron salts.

It is well established clinically that the administration of iron is very beneficial in chlorosis, in which disease some unknown process has led to an iron starvation. Although the administration of iron has no effect on the course of brief periods of anemia induced by hemorrhage, the recent results of Whipple and Robbins[2] clearly demonstrate that the administration of iron benefits long standing severe anemias induced by hemorrhage.

On the basis that iron salts are soluble in acids, many physicians have administered HCl along with iron in conditions in which the anemia was associated with achlorhydria.[1, 3] The results at best have only been salutary.[3, 4, 5]

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[*] Read before the Fifth Annual Meeting of Pacific Northwest Medical Association. Spokane, Wash., July 1-3, 1926.

Achlorhydria in Pernicious Anemia. Either achylia gastrica or achlorhydria is a characteristic finding in pernicious anemia. In 1899 Faber[6] collected thirty-three cases of pernicious anemia, all of which exhibited diminished or absence of gastric secretion. In seventy-nine cases reported by Cabot,[8] only one had hydrochloric acid in any considerable quantity. Friedenwald and Morrison,[9] who give a good review of the literature, reported seventy-six cases in which 74 per cent manifested an achylia, 19 per cent a marked decrease in secretion, and 7 per cent a normal secretion. More recently Levine and Ladd,[9] studying 143 cases of pernicious anemia, found a persistent absence of HCl in 99 per cent of the cases. They present five cases which demonstrate the importance of questioning the diagnosis of pernicious anemia in the presence of free HCl in the gastric juice.

Hurst has recently, omitting Friedenwald and Morrison's report, collected 579 cases of pernicious anemia, in which gastric analysis had been done and found that 98 per cent exhibited achlorhydria. Of 54 cases of subacute combined degeneration of the spinal cord, which is frequently associated with pernicious anemia, 100 per cent had achlorhydria.

Whether the achlorhydria is the cause or effect of pernicious anemia has been debated pro and con. It must be granted, as was first demonstrated by Einhorn[10] in 1892, that achylia can be present as a disease without leading to anemia. Vanderhoof[1] has reported 451 consecutive cases of achlorhydria due to many causes. However, twenty-nine of these cases had combined sclerosis of the spinal cord, fourteen of which also had pernicious anemia. Many diseases cause an achlorhydria, but in most of them the achlorhydria is only transitory. Faber and Gram[11] have examined ninety cases of chronic achylia and found that 36 per cent had a simple anemia.

The fact that achlorhydria may be persistent, as in true achylia gastrica, for several years without the development of pernicious anemia is held by some to be proof that achlorhydria is not the cause. But this is not conclusive proof or even strong presumptive evidence, because it is well known that pathogenic organisms can be present in an individual without causing the disease, as for example typhoid and diphtheria carriers. In the same way achlorhydria may be present even for several years without pernicious anemia developing because of the presence of powerful defensive and compensatory mechanisms in such individuals.

The fact that HCl is present in the gastric secretion of some patients with pernicious anemia either questions the correctness of the diagnosis or disproves the theory that pernicious anemia is due to disturbance of iron absorption in the upper intestine. However, it must be kept in mind that some cases of pernicious anemia might not be gastrointestinal in origin. If this is true, then the interesting and important fact is evident that the etiologic factor in pernicious anemia does not always effect the gastric glands.

Achlorhydria or Achylia is Known to Precede Pernicious Anemia. Even though the high percentage of achlorhydria in patients suffering from pernicious anemia does not show that achlorhydria is a causal factor, evidence is at hand which shows that in some cases the achlorhydria precedes the anemia.

TABLE

Showing Cases in Which Achlorhydria Preceded Pernicious Anemia

Observer	No. of Cases	Time Preceding Anemia
K. Faber	4	13, 10, 7, 3, 12 years
Bie	1	12 years
Levine and Ladd	3	6 years, 20 and 3 months
Cobet and Morawitz	1	7 years
Kuttner	1	5 years
Chas. Hunter	1	2 years
Wilkinson	2	10 and 3 years
Weinberg	1	8 years
TOTAL	14	3 months to 13 years
Sturdevant	1	14 years
TOTAL	15	

Hurst[12] has collected from the literature (see table) fourteen cases of pernicious anemia, in which the achlorhydria preceded the anemia by from 3 months to 13 years. Since that time Sturdevant[13] has reported a case in which the achlorhydria preceded the anemia by 14 years. This observation strikes me as being more than coincidental, especially in view of the fact that gastric analysis is comparatively a youthful diagnostic procedure and is rarely done as a part of a general physical examination unless the patient presents frank gastrointestinal symptoms. It is also quite probable that similar cases have been observed but not reported. Dr. Frank Smithies of Chicago has told me of a case in which he observed achlorhydria 11 years prior to the anemia.

The question logically arises, what is the cause of the achlorhydria? One answer is that toxins entering the blood from some source inhibit gastric secretion, and that in those cases in which achlorhydria precedes the anemia the gastric glands are more susceptible than the organs concerned in the destruction and formation of blood cells. Hurst[12] believes that an hereditary factor is concerned. From a study of his own cases and those reported in the literature, he states that "the familial occurrence of achylia gastrica must be the explanation of the familial occurrence of Addison's anemia. Since Hurst's publication, Faber and Gram[15] have reported three cases of anemia in one family associated with achylia, two of them suffering from pernicious anemia and one from a severe microcytic anemia.

The Occurrence of Pernicious Anemia after Gastrectomy. More significant evidence in support of the etiologic relationship of achlorhydria to pernicious anemia is the occurrence of this disease after removal of the stomach. Hurst[41] has collected five cases. I have been able to collect only four in which either pernicious or a grave anemia has occurred: One by Moynihan[40] that developed a profound anemia and died 3 years and 8 months after gastrectomy; a second by Cohn[39] that developed a grave anemia one year after gastrectomy; a third by Hartman[38] that developed pernicious anemia and died 2 years and 10 months after gastrectomy; and a fourth by Ellis[46] (loc. cit. Hurst) developed pernicious anemia 17 years after gastrectomy. I have been unable so far to get complete records. But, if we take Kreuter's[17] 1922 statement that 44 gastrectomies have been performed, and Paterson's[18] figure that 17 per cent have lived five years, we find that eight or possibly ten patients have lived sufficiently long to have developed anemia. Five gastrectomized patients are known to have developed either a grave or pernicious anemia, giving an approximate percentage of fifty, which is certainly too high to be coincidental. (We are making an attempt to bring these records up to date and to make them as complete as possible.)

When the stomach is removed, experimental achylia is produced. HCl is no longer ejected into the duodenum, and food and bacteria injected are no longer subjected to the action of gastric juice. Hence, the high percentage of pernicious anemia following gastrectomy is the strongest available evidence in support of a causal relationship between achlorhydria and pernicious anemia. It must be kept in mind that these patients had their stomachs removed for carcinoma and had probably an achlorhydria for several years prior to gastrectomy. If this observation means nothing more, it at least shows that pernicious anemia can occur in the absence of the stomach and that it is not due to a diseased stomach per se.

Pernicious Anemia after Gastroenterostomy. Campbell and Conybeare[19] and also Wilcox[20] have observed pernicious anemia to occur after gastroenterostomy. This bears upon the question at hand because of the neutralization of the gastric contents and the rapid drainage of the stomach. This observation, however, may be a coincidence because of the small number of cases relative to the large number of gastroenterostomies that have been performed.

How Does the Achlorhydria Operate in the Production of Pernicious Anemia? Some hold that the achlorhydria interferes with normal iron absorption and metabolism. The weight of the evidence at the present time is in support of the theory that the achlorhydria permits the growth in the upper intestine of organisms that produced blood destroying toxins.

It is well known that the Bothriocephalus worm causes an anemia quite like pernicious anemia, and that a cure results in the majority of cases on expulsion of the worm. This malady is associated with an achylia.[1] Sahli[1] believes that this anemia is due to the achylia which the worm causes. He cites one case, in which the anemia was temporarily cured after expulsion of the worm, but on return of the gastric disorder a fatal recrudesence of the anemia occurred, although at autopsy a second worm was not found. Tallquist[21] obtained a hemolytic lipoid from the worm which he thought was responsible, although pernicious anemia did not occur when it was injected into animals. Syderhelm[6] isolated a protein from the worm which was not hemolytic, but did cause an anemia of the pernicious type on injection into animals.

He obtained similar results with endotoxins from B. coli. Nyfeldt[6] prepared autolysates of B. coli, enterococci and streptococci and injected them intravenously in rabbits. Anemia resulted in all the rabbits. A pernicious type, color index greater than one, only occurred in 6 out of 10. On stopping the injections, a cure resulted. Kahn and Torrey[22] have recently prepared a toxin from cultures of B. welchii and injected it into monkeys. Changes strongly suggestive of pernicious anemia resulted. The monkeys developed an immunity after a number of injections, however. As early as 1906 Christion Herter[23] found a marked increase in the number of B. welchii in the feces of pernicious anemia patients and observed that during the remissions the number decreased. This has been confirmed by Simonds[25] and by Moench, Kahn and Torrey.[26] Cornell[24] has recently produced in rabbits an anemia of the pernicious type by instituting a chronic infection with B. welchii. Lowenberg[27] found an absence of the bactericidal properties of duodenal fluid in patients with pernicious anemia.

In achlorhydria the number of bacteria in the stomach and duodenum are greatly increased[12, 18, 29, 30] and Hurst,[29] Wichets,[30] and Cohn[31] have found B. coli in the stomach of patients with pernicious anemia. Hurst[12] found a hemolytic streptococcus in the duodenal contents of 77 per cent of cases of pernicious anemia, whereas in his controls—achlorhydria without pernicious anemia — it was found in only 20 per cent of the cases. Lucksch[32] has found that the B. coli strains in patients with pernicious anemia are similar to those strains that are immune to bacteriophage. The duodenal contents of pernicious anemia patients have not yet been studied for B. welchii. It is important with reference to B. welchii to bear in mind that some strains isolated from pernicious anemia patients do not produce hemolysins.[25]

This evidence supports the theory that deficient disinfection in the stomach due to achlorhydria promotes in the upper intestine an abundant flora that produces toxins (hemolytic and neurotoxic) that are absorbed and produce the anemia.

Other Intestinal Conditions Which Have Been Associated with Pernicious Anemia. Other intestinal conditions than achlorhydria have been associated with pernicious anemia. Of these chronic intestinal obstruction is the most important. In 1897 Faber[33] reported a case of pernicious anemia arising in association with chronic intestinal obstruction. Meulengracht[34] has recently collected data on eight such cases. Experimental evidence supporting this clinical observation has been reported by Seyderhelm, Lehmann and Wichels.[35] They produced in dogs a stricture of the ileum 5 or 10 cm. above the ileocecal valve. Most of the dogs did not show anemia and their intestinal flora was normal. Two of them developed in two weeks a hyperchronic anemia with megalocytes and died in ten weeks. The intestine of these animals contained a flora similar to the colon and similar to that found in patients with pernicious anemia. Dixon, Burns and Griffin[36] and Seyderhelm[37] have recently made an ileostomy on a few patients with pernicious anemia with some salutary results.

The interpretation advanced for these observations on the relation of chronic intestinal obstruction to anemia is that the intestinal flora is changed and blood destroying toxins are produced and absorbed.

In this connection it has been pointed out that in sprue an anemia indistinguishable from pernicious anemia has been frequently found by Dutch observers.[14]

Sodium Fluroide Gastritis in Dogs. Leake has given dogs sufficient amounts of sodium fluroide to cause a gastritis and achylia. He found that these animals would develop an anemia within ten weeks. On autopsy atrophic gastritis, some extension of the red bone marrow and an abnormal deposition of iron pigment in the spleen and red bone marrow were found.

Duodenal Extracts and Hematopoiesis. Eddy and Downs[42] have published a series of papers on the hematopoietic action of secretin or acid extracts of the duodenum. They report that injections of the extract lead to an increase in the number of red cells and the amount of hemoglobin.

If this is true, it has a direct bearing on the problem of the role of achlorhydria in anemia. In other words, the injection of the gastric juice into the duodenum evokes the formation of secretin which stimulates hematopoiesis. The interpretation of the results of Eddy and Downs, however, has recently been questioned by King,[43] who believes that the increase in red cells and hemoglobin was only apparent and not real, due to concentration of the blood.

Anemia in Gastrectomized Dogs. The occurrence of anemia has been observed by us (Ivy and Farrell) in three totally gastrectomized dogs, one dying at eight months, a second at seven months and a third now alive for over a year and a half. The anemia was not discovered until two weeks prior to the death of the first dog. The third animal has now been studied closely for one year and the effect of various therapeutic procedures has been observed.

The sequence of events that occur in these dogs is as follows: From four to six months after gastrectomy the animal begins to lose weight and develop an anemia. This continues until betweeen one-fourth and one-sixth of the original body weight is lost and the hemoglobin decreases to a value between 40 and 50. Anorexia develops shortly after the appearance of the anemia and gradually increases until the animal refuses food the two weeks prior to death. The routine diet of these animals is meat (1.5 pounds, ground), bread (100 grams) and whole milk (1 to 3 pints, ad libitum).

Treatment was instituted in the second animal, but his condition had advanced beyond therapeutic control. Treatment was instituted in the third dog, when the body weight was reduced from 19 K. to 17 K. and the Hb from 72 to 52. In this animal we have found that cod liver oil by mouth (8 c.c. daily) and iron subcutaneously (ferric citrate 0.1 gm., 3 times a week) will induce recovery. On cod liver oil alone body weight was maintained, but anemia developed. On iron alone no improvement whatever resulted. The feeding of liver or of milk acidified to the point of clotting was of no benefit.

The typical blood picture when the animal is anemic is as follows: r.b.c., 5 million (normal, 7 million); w.b.c., 15,000 (normal, or when not anemic, 22,000); Hb., 48 (normal, or when not anemic, 80); definite anisocytosis; polymorphs, 63 per cent; large lymphocytes, 10 per cent; small lymphocytes, 8 per cent; eosinophilic polymorphs, 11 per cent; monocytes, 3 per cent; metamyelocytes, 5 per cent. We have never observed poikilocytosis or normoblasts. We have seen a few myelocytes. This picture denotes mild bone marrow irritation. It is of interest to note that as the dog becomes anemic the w.b.c. decrease. The fall in Hb precedes the decrease in the number of reds, the color index always being less than 1.0.

Experimental Achylia from Hot Water. We have recently found that hot water at 70° C. administered every five or seven days causes an achlorhydria. This work has not yet progressed far enough to study the effect of this achlorhydria on the blood picture.

Suggestions as to Treatment. Iron: As has been said above, the administration of iron in "iron starvation" or severe anemia induced by hemorrhage is indicated. In our gastrectomized dog we found that it was of no value alone, but of value when given with cod liver oil. I believe that it should be given in pernicious anemia.

Cod Liver Oil. Cod liver oil is known to stimulate or regulate bone metabolism and to improve general nutrition. We have found it of unquestionable value in our anemic gastrectomized dogs.

Ultraviolet Light. Ultraviolet light is known to stimulate or regulate bone metabolism and to improve general nutrition. It should be applied to the entire body in gradually increasing amounts until the skin is tanned and then repeated at intervals. (I understand that Addison's anemia is rare in the tropics.)

Hydrochloric Acid. Hydrochloric acid certainly should be given with and after every meal in sufficient quantities to take the place of the gastric juice. One teaspoonful of concentrated HCl to a pint of water (flavored) or milk, should be taken at intervals during and after the meal, or injected into the stomach via a small Rehfuss tube. All cases of achlorhydria should receive HCl.

Diet. Minot and Murphy[44] have recently reported beneficial results in pernicious anemia by the feeding of a special diet, composed especially of food rich in complete proteins and iron. The diet consists daily of from 120 to 240 gm. of liver (cooked), 120 gm. of muscle meat, an abundance of fresh vegetables and fruits, a normal amount of starch, and is relatively low in fat.

Hart, Steenbock, Elvehjem, and Waddell[46] have found that some accessory food factor, which they found in fresh cabbage, yellow corn, and iron-free chlorophyll, is necessary along with inorganic iron to produce hemoglobin.

Spleen and Bone Marrow. Leake and Guy[45] have reported an hematopoietic action following the administration of spleen and red bone marorw to dogs. They offer evidence in support of the hypothesis than an augmented resistance of the erythrocytes, as well as an influx of reticulocytes, may be a factor in causing this effect.

Blood Transfusions. A blood tronsfusion is in most instances quite beneficial for at least a short period of time. I have seen the appetite improve markedly and a remission initiated. On the contrary, I have seen a blood transfusion fail to check the recrudesence.

General. All these procedures may have only a salutary effect, but they should be given a thorough trial. Any treatment or procedure undertaken obviously must be persevered in for months, and possibly for years, before one can definitely determine whether it is of any benefit, because the disease has been slow in developing and is subject normally to remissions. Of course, other sources of toxins than the gastrointestinal tract should be looked for and cleaned up gradually, preferably during a remission.

SUMMARY

Evidence has been collected and briefly discussed which strongly suggests a causal relationship between the gastrointestinal tract and pernicious anemia. The evidence is sufficient to definitely indicate the administration of hydrochloric acid with and after meals to patients that have a persistent achlorhydria. Evidence has been offered bearing on the production of gastrointestinal hemolytic toxins as related to anemia. Suggestions for treatment have been made which, however, may prove to be only salutary.

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PLASTIC SURGERY, FACIO-MAXILLARY

CASE REPORTS*

Notes on International Clinic of Facio-Maxillary Surgery, Paris, France, May 15-June 30, 1925

JOHN H. HARTER, M.D.
SEATTLE, WASH.

The International Clinic of Facio-Maxillary Surgery was held in 1925 for the first time. It is planned that this clinic shall meet annually. The didactic work is given in English. Operative clinics are conducted in the mornings at the St. Louis Hospital, cadaver work in the afternoons at the Anatomical Laboratory of the School of Medicine.

The chief organizer of this clinic is Dr. Fernand Lemaitre, chief of the Department of Oto-Rhino-Laryngology, School of Medicine, Paris. His official position and warm cooperation assure the students in this clinic an unlimited amount of cadaver material. Dr. Lemaitre is not as yet doing very much plastic surgery. However, during our sojourn at the St. Louis Hospital he demonstrated several of the most difficult operations in Oto-Rhino-Laryngology.

The St. Louis Hospital was built in the thirteenth century as a hospital for lepers. It was then outside the walls of Paris. At last year's clinic the need of appropriations was evident. Lack of screen doors was accountable for the large number of flies in all the wards and operating rooms. The postoperative care of cases was far below the usual American standard. Dr. Sheehan is now raising money to equip a suitable operating room and ward for the plastic surgery cases. The St. Louis dispensary can furnish any number of deformities suitable for correction by plastic surgery.

The chief instructors are Mr. Harold Delf Gillies of London, England, who needs no introduction; Dr. J. Eastman Sheehan of New York City, Plastic Surgeon and Chief of Nose and Throat Clinic, New York Post-Graduate Medical School and Hospital, author of "Plastic Surgery of the Nose," etc.; Dr. Ferris Smith of Grand Rapids, Mich., Plastic Surgeon and Chief of Ear, Nose and Throat Department, Grand Rapids Clinic. Dr. Smith came for the first two weeks; then Dr. Sheehan and later Mr. Gillies. These men labored faithfully with us, demonstrating all the simpler plastic procedures and many very difficult ones which only years of experience would make one competent to attempt.

This clinic will undoubtedly be conducted more efficiently each year. It is, in the short time allotted, a high-tension and rapidly-moving program and is especially suited to the needs of the physician who has done some of the simpler plastic surgery, thus enabling him to more readily follow the instruction.

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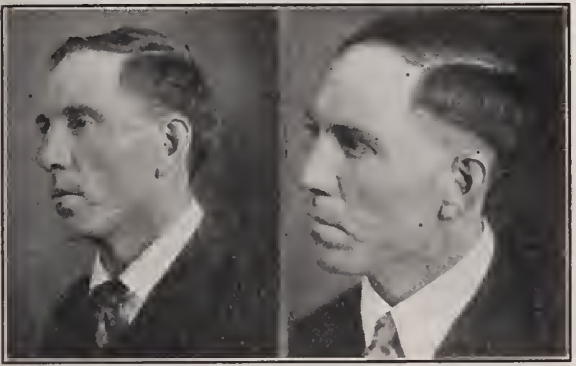
* Read before Puget Sound Academy of Ophthalmology and Oto-Laryngology, May 17, 1926.

The remainder of this paper will be devoted to case reports with lantern slides. The discussion of these cases will illustrate many of the principles of this special branch of plastic surgery.

Case 1. *Loss of tissue repaired by sliding pedicled flap and rib cartilage.* Mr. O. M., aged 17 years. Sept. 2, 1923, a 12-gauge shotgun accidentally discharged with barrel close to left ear. Patient was brought to me two hours later. About one-half the auricle was completely shot away, leaving a portion of the upper margin, also lobule. Face and ear full of powder marks.

Under ether anesthesia all powder marks were scrubbed clean with stiff brush and peroxide. Edges of wound trimmed clean. Skin flap raised from just posterior to auricular attachment back into scalp. Free end sewed into anterior defect of auricle. Piece of rib cartilage one-half by three cm. removed and planted under skin near rib incision for future use. Seventeen days later pedicle was severed and sewed into posterior auricular defect. Readjustment of remainder of flap. Sept. 30, Reverdin grafts from thigh to unhealed area. Nov. 1, removal of sharp protruding cartilage from upper portion of auricle. Small transplant of rib cartilage inserted between layers of skin in new-formed auricle.



Before operation. Fig. 1. After operation.

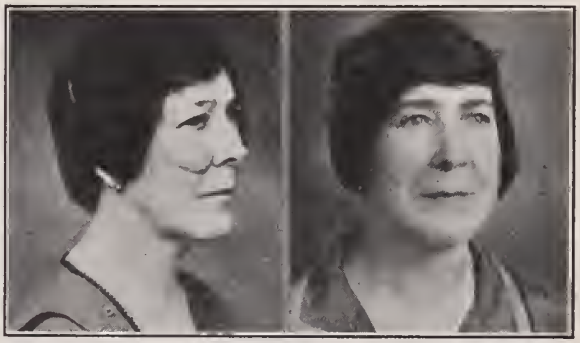
Comments. A flap might have been obtained from the arm for this case. The skin being thinner would have been more easily molded into an auricle. The color, though, would not have matched as it does now. This patient is a blond and the few hairs on the posterior auricular surface are kept clipped and are not objectionable. The scar back of ear is no worse than many mastoid scars. Subsequent shrinkage shows that a better looking result would have been obtained had more skin been allowed for the newly formed auricle.

Case 2. *Scars, depressed, wide.* Mr. C. W., aged 28 years. Old scar, thin and shiny, 2 cm. wide, extending from left angle of mouth outward for 5 cm. across the cheek. Was the result of a burn. Scar was unsightly and made it difficult for patient to shave (fig. 1).

Sept. 1, 1925, under local anesthesia scar was excised, skin undermined and brought together without tension; sutured with horsehair. One silkworm gut mattress tension suture over buttons at central portion of incision. Horsehair sutures removed in four days; silkworm suture in eight days.

Comments. This patient went back to his work as a laborer after four days. It was, therefore, deemed wise to use the silkworm-gut tension suture. This, of course, left two small scars. Had he been able to remain quiet for ten days, the incision could have been supported by adhesive tape and these small scars avoided.

Case 3. *Scars, depressed, wide.* Mrs. J. E. L. Badly depressed scar extending from right nasal ala across the cheek, curving outward and upward to lateral level of external canthus opposite tragus. Was the result of a laceration received in automobile accident. Marked bulging of tissues of cheek above scar (fig. 2).



Before operation. Fig. 2. After operation.

July 25, 1925, under local anesthesia the scar in skin and underlying tissues was excised. Deep tissues sutured with interrupted catgut. Skin sutured with horsehair, the incision near the nose being adjusted so as to form a nasolabial fold. There was considerable improvement, but scar across cheek was still moderately depressed.

Oct. 12, incision across cheek reopened and continued down through subcutaneous fat. Skin undermined. Subcutaneous fat undermined and brought together with interrupted mattress sutures of catgut so as to evert the edges of the fatty flaps just underneath the suture line. Closure of skin with horsehair sutures. Healing was uneventful and result excellent.

Comments. In a depressed scar, at time of operation, it is necessary to overcorrect the depression by some sort of buttress beneath line of scar.

Case 4. *Depression deformity. Correction by fat grafts.* Mr. W. P. V., aged 28 years. Badly deformed and depressed forehead, the result of double Killian operation six years ago. Scars in both eyebrows; that in right brow about 8 mm. wide. Median vertical scar connecting with mesial end of scar in right eyebrow. Right eye shows external strabismus with light perception only. This has no relation to deformity of forehead.

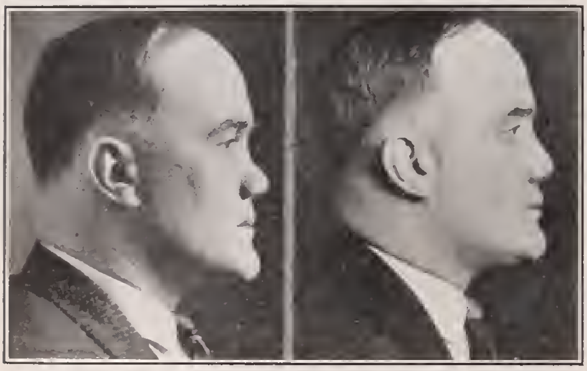
Aug. 15, 1925, under local anesthesia scar was excised from right eyebrow. Scar in left eyebrow reopened and these two incisions joined by incision carried across root of nose. Skin was raised to the lateral limits of deformity and above to the hairline. A piece of fat and fascia slightly larger than the defect was removed from the abdominal wall and inserted into defect. This was anchored above by sutures through skin. Closure of incisions with horsehair.

Following this operation there was some discharge of fatty fluid over period of nine weeks from sinuses in the incision. After healing, most of the fat had gravitated to lowermost portion of defect as shown in photograph.

March 27, 1926. Fat-graft about 2x3x4 cm. placed in defect to right of midline. Healed in five days.

Apr. 20. two fat transplants, one 2x2x4 cm. placed in defect in left of midline, second 2x2x3 cm. just above lateral portion of right eyebrow. Healed in five days.

Comments. This case requires further correction. Eventually a fairly good looking forehead should be obtained. The question arises whether it is worth while to attempt correction of such deformity with possible infection of graft from nose and subsequent trouble. I believe this need not be feared, if the nose is free from purulent discharge. In any case, if properly done, the transplants are subcutaneous and not anatomically connected with the nasal cavity.



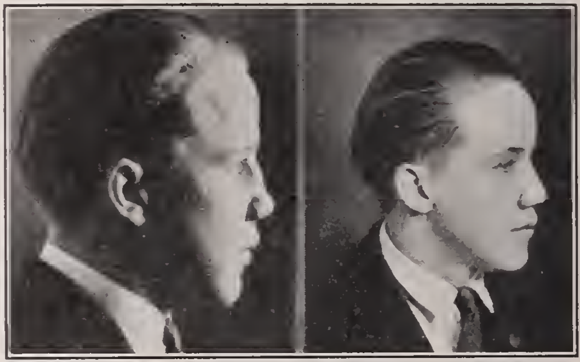
Before operation. Fig. 3. After operation.

Then, should such deformity be corrected with one graft or several small ones? And should the eyebrow incisions have been opened? I believe that it is safer and far less troublesome to undermine a pocket through a small incision and to use fat grafts not much larger than one inch in all dimensions. With very large grafts there is liquifaction of some of the fat with discharge of this and possibility of infection. The small grafts shrink but little in comparison to the large ones. With depressed scar, such as that from suppuration of cervical gland, the scar itself must first be excised and the transplant will lie underneath the incision. Such a scar becomes fixed to the transplant and the skin has not normal mobility.

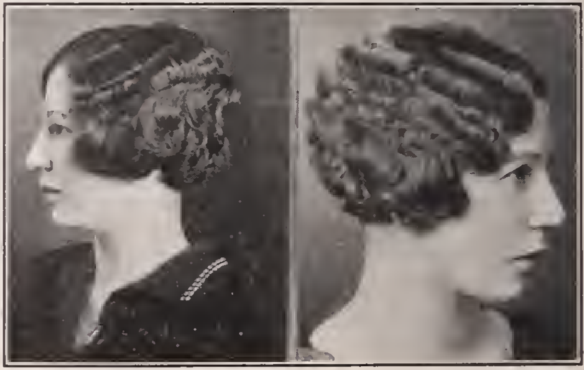
Case 5. *Depressed nose. Corection by celluloid protheses.* Dr. J. T. M., aged 31 years. Nose injured when fourteen years old by being hit head-on with baseball. Intranasal suppuration for about two months afterward. Three years later had injection of paraffin with some temporary improvement. There was moderate saddle-back deformity, nasal bones underdeveloped, a fairly good strut of septal cartilage present, alar cartilages normal, breathing space good. A dorsal prothesis was fashioned from pure celluloid (fig. 3).

Feb. 9, 1925. under local anesthesia, a vertical incision was made in subseptum and skin undermined over nasal dorsum. Prothesis was inserted, somewhat remodeled, reinserted, and found to be correct. It was then removed, incision closed and copper saddle splint applied for one day. Five days later, under local anesthesia, incision and tunnel were reopened, prothesis inserted, incision sutured. Healing by first intention; no reaction.

Case 6. *Depressed nose. Corection by protheses.* Mr. H. G. B., aged 19 years. Nose injured when nine years old by falling down stairs. Nasal breathing always difficult. Nasal bones were overprominent and roughened so that overlying skin was always red and inflamed. Bridge of nose very wide. Ridge of nose depressed distal to this. No septal cartilage present. Alar cartilages extremely thin. Tip of nose very broad and flat. Bony septum markedly to left (fig. 4).



Before operation. Fig. 4. After operation.



Before operation. Fig. 5. After operation.

Feb. 3, 1925, partial resection of septum; removal of lower border of left inferior turbinate.

Feb. 19, top of nasal bones rasped off. Nasal processes of superior maxillae sawed through and fractured mesially. Copper saddle splint applied for ten days. Celluloid prothesis prepared for dorsum and for vertical support.

Sept. 2, vertical incision in subseptum; tunnels prepared: prothesis inserted and withdrawn. Closure.

Sept. 6, incision and tunnels reopened; prothesis inserted. Closure. Healing by first intention; no reaction.

Comments. The loss of septal cartilage in these cases warns one to be watchful of the septum after

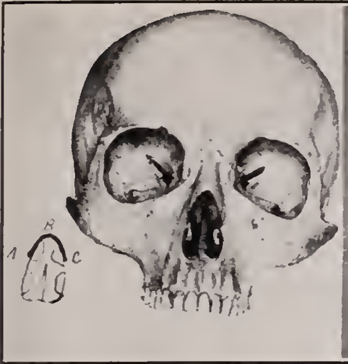


Fig. 6.

Fig. 6. Shows pyriform incision A-B-C.

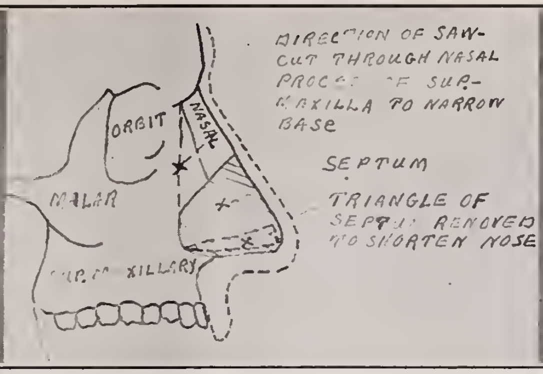

ORBIT
NASAL
MALAR
SUP. MAXILLARY
DIRECTION OF SAW-CUT THROUGH NASAL PROCESS OF SUP-MAXILLA TO NARROW BASE
SEPTUM
TRIANGLE OF SEPTUM REMOVED TO SHORTEN NOSE

Fig. 7.

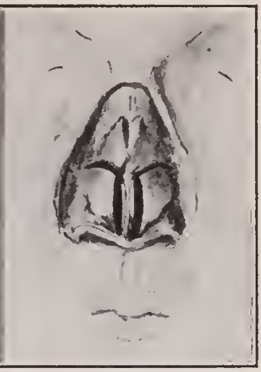


Fig. 8.

Fig. 8. A strip of tissue 5 to 7 millimeters wide, including the cartilage and its lining, is excised from the dorsum on both sides of the septum. (Cohen)

nasal injury. In intraseptal infection wide incisions must be made to avoid destruction of septal cartilage.

In profile view of case 5 after operation, a small elevation along dorsum will be noted. This is intradermal paraffin and it is deemed best to let it alone. In this case before operation there was marked false epicanthus. The prothesis raised the skin over bridge of nose and the epicanthus disappeared.

For the insertion of a prothesis, the subseptal incision gives very easy approach, leaves no visible scar, and avoids opening into the nose. By allowing a few days to elapse between making the tunnel and planting the prothesis, tissue reaction is largely avoided.

There is endless discussion as to whether prothesis should be made of bone, cartilage, ivory or celluloid. In cases like these, where a small prothesis is required, I favor celluloid for the following reasons:

(1) It is almost always tolerated indefinitely by tissues.

(2) As compared to cartilage, it can be shaped with much greater finesse down to feather edges, if needed, and it will not curl nor bend. It is almost impossible to get good looking noses such as these by using cartilage.

(3) If intolerance of tissues to the prothesis should occur, the prothesis can be removed and cartilage inserted.

(4) Inserting a celluloid prothesis is a very simple operation. It can be done in the office and the patient can go home afterward.

Cases 7, 8, 9 and 10. *Oversized nose. Long, humped, laterally deviated; correction by intranasal method.* The same technic was followed in these four cases. Ether anesthesia was used in cases 7, 8 (fig. 5) and 9; local anesthesia in case 10.

Face was cleansed with benzene and alcohol. Both nares swabbed with 95 per cent alcohol and one-half inch plain gauze packed into posterior portion of nares.

1. *Incisions and Undermining.* If tip of nose is to be narrowed, first incisions should be within each vestibule, parallel to and one-eighth inch from mucocutaneous border and close to septum. The incisions are through mucosa and cartilage. With double edged curved knife the skin is undermined parallel to septum, the knife reentering nose at upper limit to which nose is to be narrowed.

Next, incisions are made one in each vestibule just below and parallel to pyriform opening. These incisions are made continuous over the dorsum of the nose (fig. 6) and through the opening. By means of knife and periostiotome, the entire bony nose is freed from its overlying tissues.

2. *Removing Hump or Irregularities from Dorsum.* This is done in the bony portion by means of a coarse rasp. For the cartilaginous portion a very sharp knife must be used, and especially is this true for the junction of bony and cartilaginous dorsum.

3. *Narorwing the Bony Nose.* With saw introduced through pyriform incision, nasal process of superior maxilla is cut through in line from extreme lower lateral limit to junction of upper portion with nasal and frontal bones (fig. 7). Then, with heavy forceps, one blade within nose, the other within pyriform incision, or by means of pressure from without, the bones are fractured mesially.

4. *Shortening Nose and Elevating Tip.* A triangle of full thickness septum is removed base upward, the lower leg of triangle being placed just above columella (fig. 7). The base of this triangle determines the amount of shortening of nose.

5. *Narrowing the Tip.* One blade of Joseph's or similar biting forceps is placed in the tunnel described in 1, the other blade being within nose. Thus a strip of cartilage and mucosa 3, 4 or 5 mm.

wide is removed from each side parallel and close to septum (fig. 8).

6. *Correcting Lateral Deviation.* All deviated bone and cartilage must be thoroughly mobilized so that it offers no resistance to moulding.

7. *Suturing and Dressing.* Lower edge of septum is sutured to columella by one heavy through and through silk suture, this being reinforced on each side by fine silk sutures through mucosa.

Packing is removed from each naris and a fresh strip of one-half inch nugauze placed in each side. A copper saddle splint lined with surgeons lint is applied and held by adhesive strips. The gauze packing is changed every two days, being left out on the sixth day. Splint is worn for about two weeks.

Comments. Various initial incisions are used by different surgeons; through the split columella, by lifting columella after severing its attachment to lip, by intranasal incision into vestibule at different levels. In my hands the pyriform incision is easily made and gives excellent access to the bony portion of nose.

Many different kinds of splints and dressings are applied after operation but the copper saddle splint, as described by Dr. Lee Cohen, is wonderfully efficient.

Needless to say, this work is exacting and time-consuming. It should not be attempted unless the patient is extremely desirous to be rid of the deformity. I believe it a good plan to collect the fee for plastic cases in advance, as it is well known that the type of patient who does not pay his bill is the one most apt to start suit for damages.

709 Cobb Bldg.

PLASTIC REPAIR OF FACIAL DEFECTS*

THOS. F. MULLEN, M.D., F.A.C.S.
POCATELLO, IDA.

The four cardinal principles underlying the successful surgical correction of facial defects are: (1) asepsis, (2) absence of tension, (3) accurate adaptation, (4) avoidance of raw surfaces.

The most painstaking asepsis must be maintained, not only throughout the operative procedures, but during all subsequent dressings as well. The importance of this cannot be overestimated. The most perfect result is dependent upon primary healing. Infection always causes varying degrees of tissue loss and not infrequently results in complete death of a large flap or graft. In addition, infection reduces the patient's resistance and power of repair which must be raised to and maintained at the highest possible level.

It is obvious that no plastic procedure should ever be undertaken until all infection in the primary wound has been completely eradicated. A sufficient length of time should elapse after complete healing has occurred to make sure there is no latent infection hidden in some obscure area of the field. This is particularly true of those instances in which the bone has been involved.

In the repair of defects following the extirpation of malignant areas, either by the knife or by radiation, one must be certain beyond any doubt that the malignant process has been completely arrested. This is vitally true of the epitheliomatous lesions of the lips and buccal cavity. In certain malignancies of the basal cell type, which frequently involve the upper half of the face, it seems that the transplantation of flaps of healthy tissue from afar has in itself a curative value (Horsley) (figs. 1 and 2).

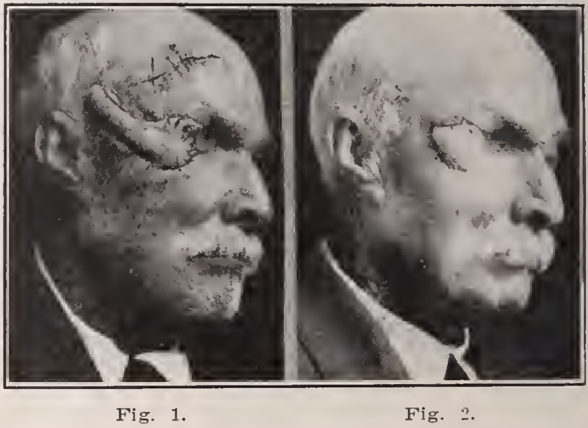


Fig. 1. Fig. 2.

Fig. 1. A. H. R. 69. Epithelioma of the external canthus. Previous evisceration of the orbit. The malignant area completely excised and a pedicled flap turned down from the forehead, tubed and sutured into the defect.

Fig. 2. Final result five months later. Flap replaced on forehead and the remaining defect closed by undermining and suture.

The passage of time is the only definite way in which to be sure of the cure of a malignant focus. If in three months after the removal of such an area complete healthy healing has occurred, one may proceed with the repair. In many instances the use of radium or the x-ray renders the subsequent correction more difficult on account of the increase in scar and the devitalization of the nearby skin.

The avoidance of all trauma to the tissues is a principle of equal importance. Local anesthesia has the advantage that it enforces gentleness upon the operator. He must, in addition, learn to work with the finest instruments and to use small sutures, very carefully applied. All cutting instruments must have the keenest edge and crushing the margins of the skin or mucosa with hemostatic or tissue forceps must be scrupulously avoided. Under trauma may well be classed undue tension. The importance of avoiding this cannot be emphasized too forcibly. Much of the function of the tissues of the face depends upon the interaction of the various parts. Mobility is the requisite essential, and it cannot be obtained in the presence of excessive tension. When tissues have to be stretched from one part of the face to cover a defect in another part, the result always falls far short of the ideal. There is not only an imperfect correction of the original defect, but an additional deformity caused by the loss of function due to the abnormal tension of the parts.

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*Read before Southwestern Idaho Medical Society, Boise, Ida., April 2, 1926.

The elimination of all dead spaces is perhaps the most important principle of all. Dead spaces mean loss of vitality in the covering tissues, in addition to increased scar, loss of mobility and finally suppuration. When a flap or graft is cut from its normal position and placed in a new bed, its cells are removed from that intimate contact with contiguous cells upon which their life depends, and which is particularly essential while new blood vessels are being established. A dead space may be formed by an irregularity in the new bed, or it may be due to the collection of blood or serum which separates the flap from the underlying structures. It is, therefore, of vital importance that the most accurate coaptation, both of the deep surfaces and of the margins, be maintained.

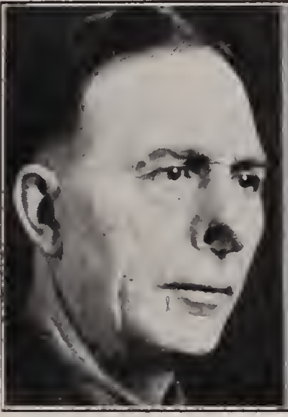

Fig. 3.

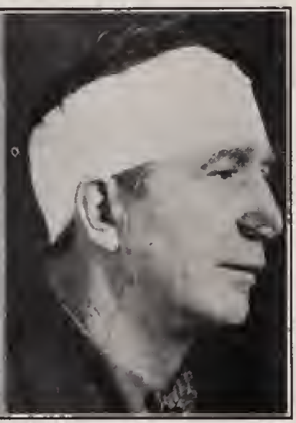

Fig. 4.

Fig. 3. P. H. 52. Loss of the alar cartilage and tip of the right side of the nose. Excision of an epithelioma.

Fig. 4. After correction. Costal cartilage shaped and implanted in a shaped flap from the right cheek. Flap raised after three weeks, turned over with skin turned into the nose to form a lining and support. Margins of the defect excised and the flap sutured in place. Pedicled flap from the forehead failed to survive. Skin covering then made with a Thiersch graft held in place by dental compound splint.

The avoidance of raw surfaces is the final fundamental principle. No raw part should ever be left exposed on any surface of the graft or flap or its pedicle. This is equivalent to saying that all flaps or grafts used to cover defects in mucous cavities must be supplied with a lining (figs. 3 and 4). Raw surfaces will surely become infected sooner or later and endanger the life of the tissue with resulting atrophy or contraction.

Defects of the face calling for plastic repair are due to three great causes: (1) Congenital abnormalities, tumors and malformations, (2) malignant disease, (3) trauma.

In those instances due to congenital causes and in which the time of operation can be selected by the surgeon, the question of preliminary wound treatment is not a great factor. The repair can frequently be done immediately after the removal of the tumor or correction of the defect. It is well known, however, that in cases necessitating the transfer of flaps from afar, the thick skin of an adult lends itself much more kindly to the procedure than does the delicate tissues of a child. An element making for success and which cannot be expected in young children is cooperation, so that those congenital defects which can only be corrected by transposed tissues had better be allowed to remain untouched until the patient is older; or, if it is necessary to extirpate a growth from a small child, perhaps cicatrization can be allowed to occur and final reparation be deferred, although it should be realized that a growing child should be relieved as soon as possible of the depressing influence of an unsightly defect which has a marked psychic effect.

In defects due to malignant disease or trauma the situation is much different, in that there is a long period of preliminary wound treatment before any plastic can be attempted. The early treatment of destructive wounds of the face is of tremendous importance. There is a natural tendency to try to make an immediate closure of large gaps in the face. More harm than good usually results, as the subsequent swelling and frequent suppuration cause increase in scar and further loss of substance. I have frequently seen large facial wounds which had been neatly sutured, and which had to be subsequently opened widely and treated as an abscess cavity. It is not the large gaping wounds which often cause the most trouble, but the smaller ones, in which deep infection destroys tissue and gives rise

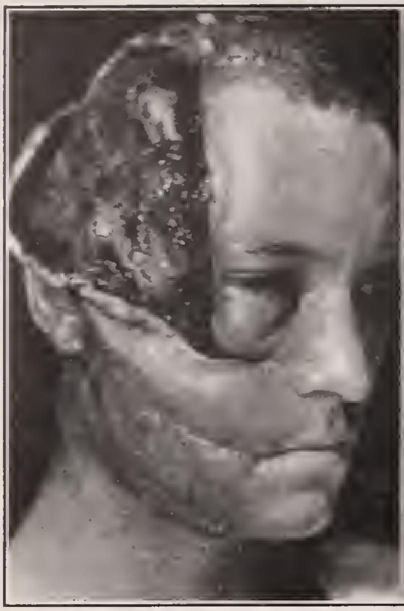

Fig. 5.

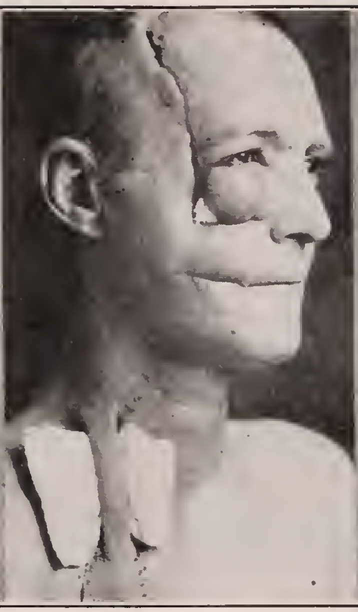

Fig. 6.

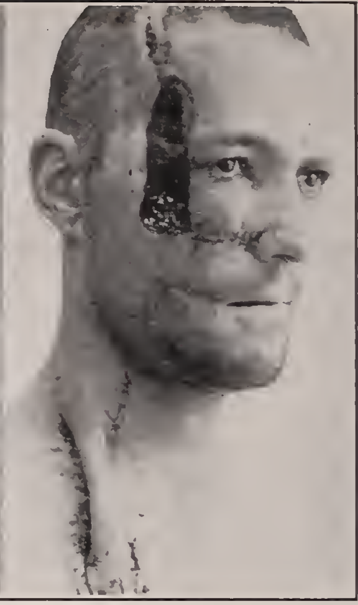

Fig. 7.

Fig. 5. R. C. 33. Partial avulsion of the scalp. Compound fracture and complete loss of the right malar bone. Loss of the outer and lower margin of the orbital rim. Partial ankylosis of the lower jaw. Parotid salivary fistula. Fracture of right maxilla and palate. Struck by train. Showing condition after ten weeks' treatment of wounds to overcome infection which was very severe.

Fig. 6. Cicatrization of wounds almost complete, pedicled flap outlined on the neck and chest, shaped plate of bone from the ilium implanted in this flap. Note the persistent edema of the lower eyelid.

Fig. 7. Four weeks later. The flap was raised from the chest preparatory to its being sutured into the facial defect which has been prepared by complete excision of all scar. The tip of the flap with the contained bone failed to live and was completely lost.

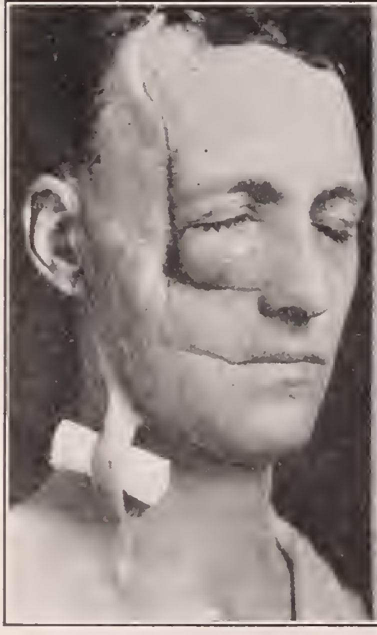

Fig. 8.

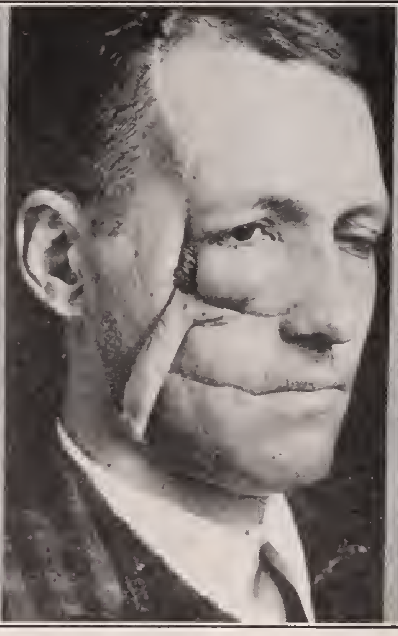

Fig. 9.

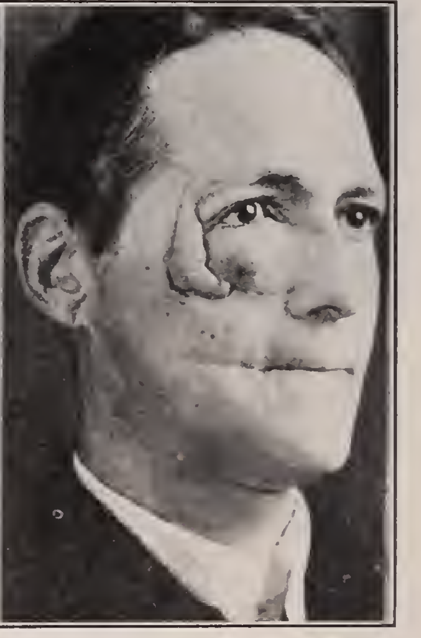

Fig. 10.

Fig. 8. Six weeks later. The devitalized part of the flap has been removed and its distal end implanted higher up in the neck in order to use the tube as a skin covering later.

Fig. 9. Four weeks later. The distal end of the tube has been divided and sutured into the lower margin of the defect which has again been prepared by the excision of all scar. The depression of the malar region has been corrected by the turning in of a flap of the temporal muscle, which was sutured to the orbicularis muscle in the effort to correct the loss of ability to completely close the eye. The edema of the lid disappears after each excision of scar but returns with healing. The scalp wound excised and resutured.

Fig. 10. Six weeks later. The distal end of the tube in the neck has been divided and the flap opened and sutured into position in the defect in the face. Subsequent slight infection of the margins of the flap resulted in some loss. This will be allowed to completely heal by cicatrization when the final step of excision of the scar and neat approximation of the skin edges will be done.

to sudden and furious secondary hemorrhage which can be most terrifying.

There are certain grossly infected wounds which had better be kept open and thoroughly treated by irrigation and packing with chlorine solution saturated gauze packs until infection has been controlled and the danger of secondary hemorrhage has passed (figs. 5-10). At the earliest possible moment, however, an effort should be made to place the tissues in their normal position under normal tension. If undue tension is required to replace tissues, they should be only approximately replaced and should never be drawn into an abnormal position. Mucous membrane should always be secured to any neighboring raw surface in order to preserve its form and vitality.

Incised wounds should, of course, be carefully sutured and adequate drainage insured. In instances, where a mucous cavity has been opened and the defect cannot be closed, it is a good idea to completely excise the wound margins and suture the skin and mucosa together, so as to limit as far as possible the amount of granulation tissue (Gillies). In cases where there is an opening into the cavity of the mouth with loss of a portion of the mandible, the ends of the bone should be smoothed and the buccal mucosa sutured across them. This prevents cicatricial approximation of the fragments and greatly aids in preventing infection of the bone. In all cases, where mucous membrane has to be sutured, it must be done with the greatest gentleness and with as little manipulation as possible.

In wounds of the mouth the cooperation of the dental surgeon is of tremendous value. The cleansing of the alveolar area, extraction of any teeth which may have to be removed and the fitting and insertion of any appliance necessary for the maintenance of proper position should be left to him. Shortening of the mandibular arch is rarely justified, since mandibular grafts are quite successful. On this account the injudicious removal of splinters of bone is to be condemned. Only those pieces which are obviously lost should be taken out. In the event of loss of the lips or nose, the stumps of mucosa should be sutured to the skin. This is of great importance later, as it is some provision for a lining of the replacing tissues.

Early in treatment of severe wounds of the face, it is useful to make an estimate of the degree of damage and the amount of tissue lost, and the treatment should be carried out with the possibilities of the future restoration in mind. It is of advantage to the surgeon who will do the repair, to see the patient as soon after the injury as possible. His advice as to the disposition of flaps and shreds may be valuable. To this end early photoghraphs and diagrams are of value.

In summing up the treatment of wounds of the face, the governing principles are: (1) the early control of infection, (2) preservation and restoration of all normal tissue to its normal position, (3) avoidance of stretching or tension.

In late cases, where complete healing with contraction has occurred, it is frequently necessary, in order to plan the repair, to reconstitute the wound by the release of stretched and contracted tissues. In these instances it is sometimes difficult to accurately estimate the loss of substance until this reconstitution of the wound has been done. The appraisal of tissue loss should be made separately in regard to: (1) the mucous lining, (2) the bony or cartilaginous framework, (3) the skin covering.

Involvement of important structures, such as the facial nerve, orbicularis muscles and parotid duct, should be taken into consideration. The restoration should be designed from within out, so that it is necessary first to consider the supporting structure, then the lining membrane and finally the skin covering.

THE SUPPORTING STRUCTURES

The contour of the face is dependent upon the underlying structure which is of vast importance in the matter of expression. An estimation of the bony loss is, of course, a prime requisite, since it is necessary to know its degree in order to determine how much tissue is necessary to cover it. This appraisal necessitates examination of the interior of the mouth and nose, as well as palpation from every angle. The statement of the surgeon who saw the wound in its original state may be of great aid in this connection. For example, he might be able to say that he had completely removed the entire malar bone, or so much of the mandible.

Having determined the degree of loss, it is necessary to plan its resoration. A great variety of substances has been used for artificial implantation, but they should always be avoided whenever it is possible to use the patient's tissues. In fact, it is a good working principle to make any replacement with tissue of a nature similar to that which has been lost.

The two tissues available for replacement of the framework are bone and cartilage. The latter has several advantages. It is available in sufficiently large quantities, it is permanent and is easily fashioned. Furthermore, it retains its original shape with the exception that, if only one surface is left covered with perichondrium, the cartilage has a tendency to form a curve with the concavity of the perichondrial side. In addition, cartilage is quite resistant to adverse conditions. Owing to the fact that it is not a richly nourished tissue, it is able to withstand some hardship. It is best obtained from the costal cartilage, shaped and applied. Any excess may be placed beneath the skin and kept as a further supply in case more is needed.

The insertion of cartilage may be accomplished in several ways:

1. It may be introduced subcutaneously into its permanent position.

2. It may be inserted under the skin in the region from which the flap will later be raised, and turned into position on the deep surface of the flap.

3. It may be built into its final position between the lining and the covering before the flap is raised. This may be done by placing it between two layers of the flap doubled upon itself or between the flap and a Thiersch graft covering its under surface. I have placed a cartilage graft in a pocket of a thick flap before it was completely raised, inserting it between the deep fascia and skin, but this is inadvisable as it interferes with the circulation (fig. 7). When cartilage is placed in a flap before transfer, it should be allowed to remain for at least three weeks before being moved. In this manner only can it become an integral part of the flap, and any effort at changing its shape or size after it has been transplanted places its life in jeopardy. Retaining sutures should not be passed through cartilage, but only through its perichondrium.

When a softer substance is desired, as in depressed scars of the cheek or chin, not involving bone, local flaps of fat or muscle may be turned over. For larger defects free flaps of fat or muscle may be used, but they are uncertain. They sometimes undergo partial absorption, owing to necrosis and if infection occurs in the slightest degree, they are usually completely lost.

The use of bone grafts in the face has been restricted to the correction of mandibular and malar defects. Bone may be obtained from the ribs, in which event a portion of cartilage may be taken with it, although in one instance I have had the cartilage live and the bone die in this type of graft. It may also be taken from the iliac crest. Here the bone is spongy, vascular and tough, and is easily penetrated by growing blood vessels. Bone may be inserted as is cartilage, but it must always be remembered that neat contact of the graft with living bone must be obtained.

The lining membrane must necessarily be made of mucous membrane or skin. If in the early treatment of the original wound, tabs and strips of mucosa have been fixed in position, they will now be very useful and can be turned into the defect as the lining of a graft or flap. In the same manner flaps of skin may be turned in with the epithelial surface facing the cavity, or the lining may be supplied in the form of double skin flaps. There are certain occasions in which it is necessary to provide only a lining, as for instance, in cases where the eyeball has been removed and subsequent contraction prevents the successful use of an artificial eye. Another example is in the correction of an obliterated labiogingival sulcus, which it is necessary to deepen in order to wear an artificial denture. The so-called epithelial inlay as developed by Esser meets the requirements in these cases admirably. It consists of the insertion of a moulded piece of dental compound, around which a Thiersch graft has been wrapped, with its raw surface outward. This use of the epithelial inlay has been modified by Gillies in the cure of ectropion (figs. 11-12).

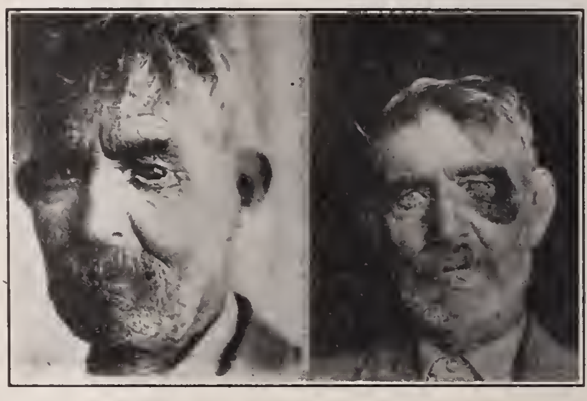

Fig. 11. Fig. 12.

Fig. 11. R. A. 60 years. Cicatricial ectropion, left.
Fig. 12. After excision of scar, and epithelial inlay. Discoloration due to iodine.

THE COVERING TISSUES

Skin is the only available material which makes a suitable covering. This may be supplied in the form of a flap or graft. Pickerill divides grafts as follows:

1. Free grafts. Thiersch and Wolfe. Bone, cartilage and fat from a distance.

2. Pedicle grafts. Skin, muscle, fat, bone from adjacent region.

3. Tube. Tube flap. Single or double. Tube graft.

THE THIERSCH GRAFT

It is my experience that these grafts are usually cut too thick and with uneven edges. One should be sure that he obtains a good layer of the epithelium and that its margins are as thick as its middle, and not thin and serrated. A sharp, heavy razor is the best instrument for cutting, and if by using a sawing motion in obtaining the graft, the edges are uneven, they should be trimmed before the graft is applied. The thin skin on the inside of the arm furnishes a splendid graft for lining the lip and eyelid.

The Thiersch graft has many disadvantages, when it is used over large defects or in areas subjected to pressure. It is apt to remain white and to become adherent so that the normal mobility of the skin is not counterfeited, and it has the further disadvantage that it is easily broken down by irritation. It should be reserved for small defects where a thin layer only is needed. Three requisites are essential for its success: a clean, dry bed, close apposition and immobility.

For larger defects, such as for closing the areas made in removing a flap, particularly one from the forehead, the Wolfe or whole thickness graft cannot be equaled. It is remarkable how elusive is the knack of using a Wolfe graft. It seems so simple but in reality there are few men who confidently approach the task of using a large Wolfe graft. The factors which determine its success may be summed up in a few words, which include infinite care and gentleness.

The graft is cut to the exact size of the defect with a sharp knife which passes through the full thickness, and the skin is freed from all subcutaneous tissue and vessels. Blair, who is exceedingly skillful in using this type of graft, states that the "under surface of the skin should show white and stippled, with little fat, and should show no bleeders." After cutting, the graft is folded with raw surfaces opposed and covered with warm, moist gauze and placed in a secure place until used, which should be as soon as possible, the bed having been prepared before the graft is cut.

As in the use of other grafts, firm apposition and accurate coaptation of the edges are necessary. The graft should be firmly pressed into its new position and kept there immovably for three weeks, the edges being nicely sutured to the skin margins of the defect without constriction. All oozing should have been controlled and collections of serum or blood must be prevented by the pressure of the dressing.

The tension of the newly placed graft is of importance. It should be based upon the tension of the skin in the area from which the graft is taken and not that of the position into which it is applied. It is needless to say that not the slightest movement of the graft may be permitted after it is placed in position, and it follows that the greatest usefulness is in those areas which have a bony or cartilaginous foundation, as the forehead, scalp or nose. In addition to proper tension of the graft, an adequate venous return must be supplied. To insure this, a certain amount of pressure on the graft is needed. This is supplied by the dressing.

SKIN FLAPS

This manner of transferring skin from one area to another has more possibilities than other methods, since the nourishment of the skin is more assured. All skin flaps are necessarily pedicled, that is, they remain attached in their original site at one or more points of their margin. In keeping with the general principle that new scars on the face are to be avoided, flaps for the repair of facial defects should be taken, if possible, from the scalp or upper thorax, anterior or posterior, or from the forehead. In cutting any flap, and particularly those with long pedicles, as from the chest, careful consideration must be given to the circulation. Incisions should be clean cut with an avoidance of bruising, hence tissue forceps and scissors should not be used. Hemostasis should be thorough, vessels being tied with very fine plain catgut which has been soaked to pliability. If the circulation is assured, as for instance when a large arterial trunk is included in the pedicle, the flap may be raised and transferred immediately. In other instances, and this particularly applies to flaps raised from the chest to the face, where the circulation is a matter of speculation, it is better to convert the pedicle into a tube by uniting the skin margins and leaving the two extremities of the flap uncut, making what has the appearance of a satchel handle. After ten days or two weeks, when the circulation through the pedicle is safe, the distal extremity of the flap may be cut at one operation, or it may be done a little at a time in the series of steps so as to gradually cut off the blood supply (figs. 13-18).

Sometimes, after the flap is cut and ready for

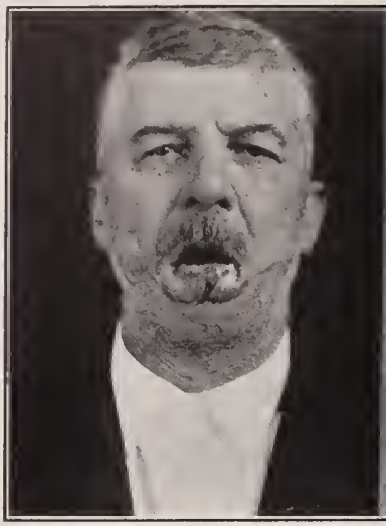

Fig. 13.

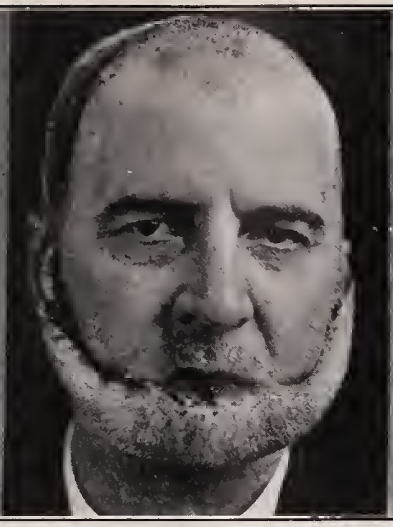

Fig. 14.

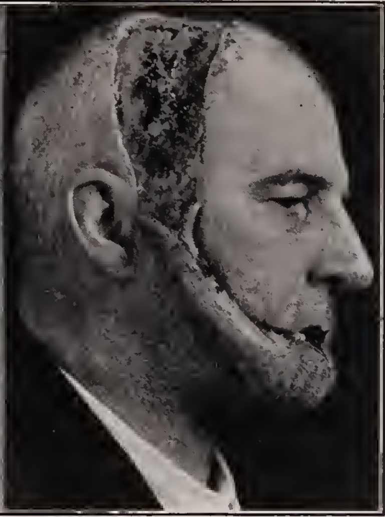

Fig. 15.

Fig. 13. R. H. Age 56. Loss of lower lip and soft tissues of the chin following the use of "Cancer Paste" for the removal of an epithelioma of which the ulcer in the center of the adherent mucosa is a remnant.

Fig. 14. The epitheliomatous ulcer excised widely. The mucosa turned upward as flaps hinged on the alveolar border and lining a double tubed flap from the scalp having the temporal arteries in its pedicles. The old scar has been carefully excised and the flap sutured to the margins of the defect.

Fig. 15. The same stage in profile.

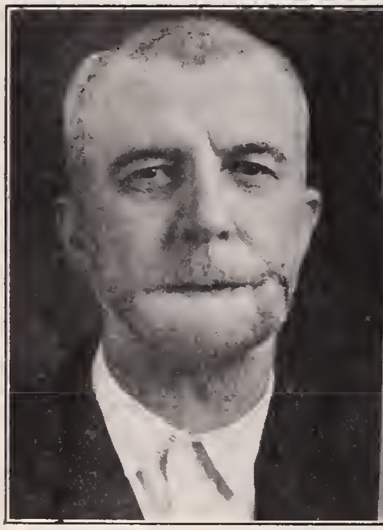

Fig. 16.

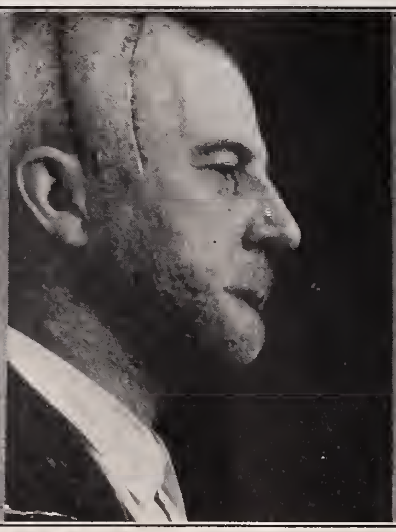

Fig. 17.

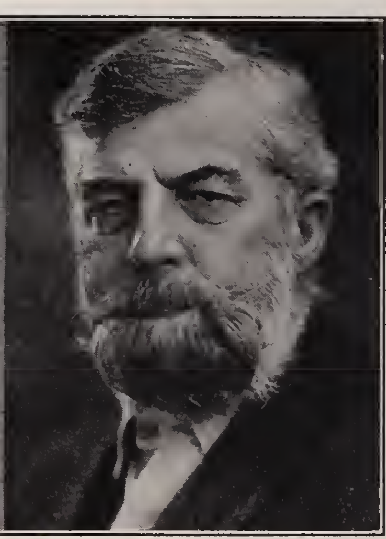

Fig. 18.

Fig. 16. The pedicles divided, tubes opened, core excised and the flaps restored to the scalp. Excellent restoration of the vermillion, showing the value of preserving flaps of mucosa.

Fig. 17. The same stage in profile. The scalp defect closed with Thiersch grafts.

Fig. 18. Final result one year later.

transference, it may be obvious that the circulation is inadequate. This may be evidenced by the complete absence of bleeding from the cut end, or by pallor and coldness. In this event, the flap had better be immediately sutured back into the bed from which it has been removed, and allowed to heal into position, taking all the precaution of careful approximation of deep surfaces and margins. If it is turned up into its new bed under these unfavorable conditions, it is almost certain to die, whereas the inflammatory change incident to the healing will aid in reestablishing and augmenting its circulation. One acquires an instinct for prophesying the vitality of the flaps he cuts, but must go through a certain amount of disappointment before he can feel certain about it, and in nearly all cases, where flaps are turned up from the thorax, there is usually an anxious period for the first forty-eight hours.

In cutting flaps, the base should be at least as wide as any other part of the flap and perhaps wider in most instances. The only noteworthy exception is in the case of those flaps which contain a definite arterial trunk. The length of the flap which may be taken depends more upon its depth than upon its breadth. Those which are only skin deep are hazardous. They become swollen and edematous and often die from venous obstruction. If only skin tissue is needed, a Wolfe graft had better be used if the bed is suitable. Often the flap will retain a normal color after it is sutured into its bed, but not infrequently it will assume a livid and forbidding aspect. This is not incompatible with a favorable outcome and, unless the swelling reaches a dangerous degree, the flap had better not be molested. In the event of marked cyanosis, multiple needle punctures may be made in it to relieve the congestion, but there is an element of danger in this, in that it opens up avenues for infection and causes minute thrombosis. Perhaps gentle stroking is better and best of all is the proper degree of continuous pressure.

After the flap has been freed, it should immediately be placed in the new bed which has been prepared to receive it. Neither the flap nor the bed may contain any scar tissue, which is of low vitality, is bound to swell and is very likely to die.

The vitality of flaps varies in different regions. Those from the forehead and temporal regions, in which the artery or its branches are incorporated are safe, as are those based about the chin, while ascending flaps from the neck and chest carry possibilities for disaster and must be carefully planned and gently handled. Small flaps turned over from the edges of an old defect, to form a lining, must be carefully cut, and the incision upon which they are hinged must not too closely approach the surface.

Much security and neatness has been gained by the method of tubing the pedicle of a graft (figs. 13-18). This consists in suturing the lateral skin margins of the flap together so as to convert the flat strip into a tube. It does away with raw surfaces and scar and leaves tissue for the closure of the defect made in taking the flap. The margins of the skin can be sutured under the tube and thus completely close the field. The flap may be completely tubed and the distal extremity used as a graft by simply opening one of its edges and suturing it into its new bed. This is useful in repairing defects of the lips. When the flap has been sutured into position, it should be allowed to remain for two or three weeks. The pedicle can then be cut, opened and returned to its original position and the final touches given to the transposed tissues.

In planning flaps, careful, exact measurements should be made with a caliper and platted on a paper diagram and a pattern of the part to be restored should be made with a sterile piece of tin foil which can be laid on the face and made to fit accurately the defect. With some defects of the nose or lips it is a great aid to make a plaster cast of the face, and then build up the missing part on the cast with wax, using this as a model for the final restoration. When an immediate transfer of tissue is to be made at one operation, it is well to prepare the field before the flap or graft is cut. All cicatricial tissue must be carefully removed and hemostasis must be complete. Where a delayed transfer is contemplated, it is better to defer the preparation of the defect until the time when the flap is ready, otherwise a granulating, and possibly an infected surface will be present to receive it.

AFTER CARE AND DRESSING

There are many wounds of the face which make much better progress if they are allowed to remain uncovered and exposed to the air. Incised wounds are in this category and wounds which are liable to be bathed in secretion from the nose and mouth and in which a gauze dressing soaks up the fluids and soon become a septic poultice. In aseptic wounds of the face left open to the air, it sufficies to make a light application of 3 per cent xeroform ointment or of Whitehead's varnish to the suture line.* The varnish makes an excellent dressing for wounds of the mucous membrane.

Many methods of dressing Thiersch grafts have been devised and Coller says that, other things being equal, the final result will vary in skin grafting with the technic of postoperative dressing. He advocates the use of paraffine sprayed on as a covering dressing and I have found this to be a very satisfactory method of dressing Thiersch grafts. The essentials of any dresing are to maintain an even, constant pressure, and to prevent movement and the accumulation of wound fluids.

For dressing whole thickness grafts and large flaps, where pressure must be maintained and secretion cared for, perhaps the most satisfactory method yet devised is that which utilizes the marine sponge, as advocated by Blair and by Davis and Traut. It is described by Blair as follows: "After the flap or graft is in place and before the final dressing is applied, the clots and fluid are pressed out by rolling over the surface a roll of gauze. The surface is then covered with several layers of gauze impregnated in 3 per cent xeroform ointment. Over this is applied a large, soft, damp marine sponge which is bandaged in place with a little pressure. The quality of the sponge and the tension are important factors. A sponge of good quality is used which when dry measures one and one-half inches thick by four or five inches in diameter. They are prepared by being washed, soaked in an antiseptic, rinsed, dried and put away in a jar. When used, they are wet with saline and wrung out as dry as possible with a towel. If pressure is to be depended upon to control bleeding, it is well to put an inner bandage over the sponge at the tension it is desired to maintain on the graft for the full length of time, and over this a much tighter bandage to stop oozing may be applied and be removed in two or three hours. The sponge pressure on the graft should be firm but should not cause ischemia of the graft. All gauze dressings should be laid on smoothly and the bandage not wrinkled or reversed. If asepsis is sure, the dressing can remain undisturbed for three weeks."

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* Xeroform ointment. Tribromphenol-bismuth. Whitehead's varnish. Compound tincture of benzoin, in which the alcohol has been replaced by a saturated solution of iodoform in ether.

Blair states that it is usually safe to look at a graft on a child or infant in five or six days and in an adult seven to nine days after the operation. If the dressing is removed for any reason before these dates, it should be replaced in the same manner. Leaving off pressure too early favors the formation of blebs which predispose to ulceration. Blebs which are infected, or threaten to become so, are treated once a day with 1 per cent solution of silver nitrate. The sponge dressing supplies a smooth, even pressure over the entire graft, and as the sponge dries, it forms an exact cast of the area covered. One danger which must not be lost sight of is the possibility of an increase of pressure due to blood or wound secretion being taken up by the sponge.

The pedicle of a flap need only be supported by fluffed gauze and the angles of the suture line covered with 3 per cent xeroform or 4 per cent ammoniated mercury ointment. The flap or pedicle should not be kinked, even if only for a moment, as it takes very little to jeopardize its life. When pressing a graft or flap into position, it should be covered with a sheet of rubber and sliding motion should be avoided so as not to damage the upper layer of cells. Finally it should be emphasized that there is no set time for doing dressings. They should be done by the surgeon himself and often enough to insure the safety of the involved parts and the most scrupulous cleanliness of the entire surrounding area.

BASAL METABOLISM*

W. G. Richards, M.D.
BILLINGS, MONT.

In choosing the subject of basal metabolism for the title of this paper I have been influenced by the fact that I find something of a difference of opinion among physicians as to the value of its estimation for clinical purposes. Some there are who would give it very little place as a diagnostic measure, while others have almost a childlike confidence in it, and are inclined to look upon the mere figures of its determination as the final argument in the recognition of certain diseases. To bring the matter up for discussion, then, seems to be desirable, for if a medical society has any value at all it certainly is in supplying opportunities for debating differences of opinion.

That we should all agree on any subject is only doubtfully desirable, but many differences of opinion disappear with the fuller knowledge which comes from a free exchange of views. Toleration has never been a conspicuous virtue of the human race, and is not now, but amongst scientific men at least a larger degree of it should obtain, for they more than others can appreciate the losses the world has suffered from the intolerant spirit. This allusion owes its pertinency here to the fact that Lavoisier, the first inventor of metabolism apparatus, was executed during the French Revolution for his unorthodox political opinions, with we know not how much loss to the subject of metabolism.

In the metabolic processes of the body, as you all know, heat is produced, along with carbon dioxide, and in this process oxygen is consumed. The number of calories of heat produced or oxygen consumed is proportional to the degree of activity. An estimation of any of these factors will give the degree of metabolism at that particular time. When the amount of heat is measured, this is spoken of as "direct" calorimetry, and when the amount of oxygen or carbon dioxide is measured, this is called "indirect" calorimetry.

In direct calorimetry the subject is placed entirely within a chamber, the walls of which are so constructed that no loss of heat can occur through them, and the heat produced by the body removed by a current of water circulating in pipes within the chamber and measured. Similar chambers are used for the indirect method, the quantity of oxygen consumed and carbon dioxide produced being calculated. This kind of apparatus has the additional advantage that the three factors—heat, carbon dioxide, and oxygen—may be measured at the same time, and for research work is the method of choice. By its use, using normal individuals for subjects, average metabolic rates have been determined, which are now used for standards for clinical work.

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* Read at a meeting of Yellowstone Valley Medical Association, Billings, Mont., April 15, 1926.

But clearly, if the method was to become useful for the practicing physician, simplification of the apparatus was necessary. With this end in view, the chamber was eliminated, and various devices adopted by which the subject was supplied with either air or oxygen, and the carbon dioxide of the expired air calculated or simply the amount of oxygen consumed, the individual being connected by rubber tubes leading to his nose or mouth. The methods which depend upon analysis of the expired air being somewhat complicated, are now practically limited to the larger clinics and hospitals, though they have the advantage of greater accuracy, while for ordinary work, especially at the patient's own bedside, the simpler machines, measuring only the oxygen consumed, are, if not the method of choice, at least the method of necessity and, if one intelligently recognizes their limitations, sufficiently accurate.

As the metabolic rate, however, would naturally vary according to the degree of activity of the subject, for purposes of comparison some standard set of conditions is necessary. These conditions have been established with the patient in a state of complete rest and from twelve to fourteen hours after the last meal. The figures thus obtained are what is known as the "basal metabolic rate." Strictly speaking they are not basal, as to obtain this the patient would have to be in a state of profound sleep and in a condition of undernutrition produced by the maximum of fasting compatible with life. Hence a more accurate term would be the "standard" metabolic rate. Personally I rather regret that this term was not adopted, for it would have emphasized the need of complying with the accepted conditions but, like much other medical terminology, though we know it to be inaccurate, we shall probably from sheer inertia continue to use it as long as we use the method.

But it is this very necessity of observing standard conditions which so often makes the figures obtained misleading. This is the more unfortunate, for the determination of the basal metabolism has become almost entirely limited to the recognition of thyroid disease, and it is in disorders most simulating clinically this disease that the standard conditions are hardest to obtain.

At first sight it would seem to be a matter of the greatest simplicity to put the patient at rest, and to starve him for fourteen hours surely presents no difficulty. Having done this, it would appear that nothing more would be necessary than to connect him with the apparatus, start it up, and after running it for a definite time read off the figures and make the necessary calculations which, thanks to the enterprise of the instrument manufacturers, have been put in such an accessible form that only the most elementary knowledge of arithmetic is necessary.

Unfortunately it does not work out this way. I do not believe there is any test used in medicine today which requires greater care and more intelligent watchfulness. In the first place, the machine itself needs constant supervision. It may develop leaks, the mouthpiece or nosepiece may not be accurately adjusted, a bend in the tubes may cause resistance to the free passage of air or oxygen, so that greater effort on the part of the patient may be needed to overcome it, or many other things may happen, only learned by experience and only recognized by the greatest vigilance.

Again, it is by no means easy to be sure that the patient is in a state of rest. He may be quietly lying on his back, may even have his eyes closed and be motionless, but for all that he may be keenly watchful and alert. Nor is this to be wondered at. Take the average individual, of even moderate nervous excitability, put him in a room surrounded by what must appear to him fearful and wonderful machines, then plug his nose or mouth, and all the directions in the world to lie quietly and breathe easily will often fail to produce placidity and calm.

To secure correct determinations one has to read the patient even more carefully than the scales, for if the results obtained indicate a high degree of metabolism, one has to decide whether the conditions were really basal, and this one can only do if he has made the test and watched the patient himself. A considerable error may result from irregular breathing. If the subject be not warm, the metabolism may increase from the effort of the body to produce more heat to maintain a constant temperature. Even such an apparently simple matter as the taking of ice water has been shown by Cannon[1] to increase the metabolic rate as much as 35 per cent.

Because of all this I doubt the wisdom of handing such work over to technicians. The only reason we employ technicians is that, being cheaper, they set the physician free for more lucrative work, and the principal reason some people are willing to do the less remunerative work is that they are incapable of the more remunerative. The high grade technician soon graduates into medicine itself. Exceptions, of course, there are, but generally I think this holds true.

Are we, then, discharging our whole duty to our patients in a matter in which an operation or even life itself may depend by handing it over to relatively cheap help? Incidentally I think we are coming to depend too much upon technicians in many things. Undoubtedly they relieve physicians of much work, and in so far as they are specialists in matters in which the physician is lacking, no criticism can be passed, but the ambitious doctor, when relieved of some variety of work, usually simply takes on some other, and often, while eloquently advising his patients of the dangers of overwork, himself develops arteriosclerosis and dies a horrible death from angina. The profession is all the time losing its most valuable men at the time of their greatest usefulness. How much more would we have gained if John B. Murphy and Sir James Mackenzie, to mention only two, had worked a little less strenuously and continued longer with us? And it is equally true of the many men doing good work even in small communities who pass away almost as soon as their judgment becomes ripened and mature. In life, no less than in racing, one needs to save one's wind for the end stretch.

As an internist the subject of degenerative cardiac and vascular disease is one of absorbing interest, and I am in hearty sympathy with the efforts being made to combat the increasing incidence of these affections, but I cannot help thinking that before we as physicians embark upon a campaign of education we should first pay some attention to ourselves, for fear that, like Ophelia, they may reply:

> Good, my brother,
> Do not, as some ungracious pastors do,
> Show *me* the steep and thorny way to heaven,
> Whilst, like a puffed and reckless libertine,
> Himself the primrose path of dalliance treads,
> And recks not his own rede."

To secure basal conditions, in other words, to get the patient at rest physically and mentally, often requires considerable ingenuity. One method is to give him a practice test, to familiarize him with the appearance of the machine and the mechanism. I think this should always be done. When the rate is abnormally high, it should be repeated on some subsequent day, three or four times, if necessary, before definite conclusions should be drawn. It is surprising sometimes how the rate will go down on later examinations without anything at all being done in the way of treatment, a circumstance which will suggest a healthy skepticism as to the reputed effects of various methods of treatment based on basal metabolism tests. I have been told that at one large clinic the tests are made by three separate technicians on as many occasions, a very commendable procedure. If one repeats the test two or three times immediately following one another, as one should, generally quite a variation will be found. Most often, I think, the second will be lower than the first, as the patient settles down, but sometimes he seems to get tired and irritable with the repetition, and the rate goes up. Directions as to how to conduct the test sometimes tell one to make it three times and to take the average. I cannot see the philosophy of this. Presuming, of course, that everything else is all right, it would seem to me that the lowest of a series must be the most nearly basal, and I always use that.

Speaking of the methods which depend simply on the amount of oxygen consumed, Hunt[2] says that if three-minute spells of oxygen breathing are observed, the first is higher than the second, up to 25 per cent, due to simple solution of oxygen in the blood, but that after the third period the consumption remains fairly constant.

As to the value of the test in the diagnosis of thyroid conditions, the only argument of any value is the appeal to experience, and probably the most complete series of cases is that reported by Boothby[3] at the Mayo Clinic. He reports a series of 8,614 cases, on which basal determinations were made. Among these, in 2,569 cases of exophthalmic goiter, 93 per cent showed an elevation above 20 per cent. Of 1,425 toxic adenomas 68 per cent were above 20 per cent, and 32 per cent between 10 and 20 per cent. Of 1,111 nontoxic adenomas 100 per cent were between plus 10 and minus 10. Of 328 colloid goiters 3 per cent were between plus 15 and 20, 10 per cent between plus 10 and 15, 79 per cent between plus 10 and minus 10, and 8 per cent below minus 10. Of 102 myxedemas 20 per cent were between minus 10 and 20, and 80 per cent below minus 20. Of 28 cretins 21 per cent were between plus 10 and minus 10, and 79 per cent below minus 10.

DuBois[4] sums up the question as to the reliability of the method as follows: "There seems to be a striking unanimity of opinion that the level of the basal metabolism is the best guide to the activity of the thyroid gland. . . . . We must remember, however, that we are dealing with a laboratory test, and that it must not be accepted blindly. . . . A slavish adherence to the basal metabolism test as an index of diagnosis may lead the physician to trouble, first, because the test does not always give the true basal metabolism, and, second, because even the true basal metabolism is not always the indication of the correct diagnosis. God forbid that we make our diagnoses by machinery."

One of the most confusing factors in the proper evaluation of basal metabolism determinations is the effect of emotional conditions. Even in normal individuals emotional influences may cause a very definite rise. Grafe in Germany[5] hypnotised a number of normal men and women, and then suggested terrible calamities happening to them. In nine of them there was an increase of metabolism ranging from 5 to 25 per cent. In this country Ziegler and Levine,[6] by inducing psychoneurotics to remember certain unpleasant experiences, were able to produce a rise to as much as 40 per cent. This should be remembered in the case of highly emotional subjects, who also frequently have simple goiters and tremors.

In the diagnosis of other disorders of the glands of internal secretion basal metabolism determinations help only slightly. Of 13 cases of Addison's disease reported by Boothby[7] 1 was plus 20, 2 below minus 20, 1 between minus 11 and 15, and the rest within normal limits. Of 30 cases of acromegaly the majority were within 15 per cent of normal, but 8 were more than 20 per cent above, indicating a tendency to heightened metabolism in this disease. Per contra, in 58 cases of hypopituitarism, though most were within 15 per cent of normal, a third showed distinct depression.

Grafe[8] summarizes his conclusions as to the effects of the sex glands on metabolism by stating that a total absence or diminished function of these glands only exceptionally causes a diminution in the oxidative processes, which is concurred in by DuBois, though I do not know as to the effects of sexual overactivity. It is conceivable that the sexually overdeveloped, the so-called passionate, might show a heightened basal metabolism.

In the blood diseases both leukemia and polycythemia show definite increase of metabolism, that in leukemia being sometimes as high as in severe forms of Graves' disease.

In cardiac disease one should be careful in drawing conclusions. While in ordinary compensated conditions basal metabolism will be normal, with failure of compensation it is liable to be considerably elevated, the elevation apparently depending upon the degree of interference with respiratory function. This is important, because auricular fibrillation, while a common result of old-standing rheumatic and other heart affections, is also frequently found in Graves' disease in later life, so that if a person with an old rheumatic heart who has developed auricular fibrillation happens also to have an enlarged thyroid, a basal metabolism test, if too implicitly relied on, may wrongly incriminate the thyroid. With heart failure and a rapid pulse the same confusion may arise.

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THE RELATIONSHIP OF IODINE TO THE HUMAN THYROID GLAND*

J. Earl Else, M.S., M.D., F.A.C.S.
PORTLAND, ORE.
Chairman Department of Surgery
University of Oregon Medical School

The first reference to the use of iodine in thyroid disturbance dates back to the early Greeks, who used it unknowingly and empiricly in the form of ashes of sea sponges. Coming down through the literature there are various references to iodine in connection with goiter, but its practical use really began with the work of Marine and Lenhardt, when they discovered that the goiter of fish in a fish hatchery could be prevented by placing iodine in the water.

Various substances rich in iodine were extracted from the thyroid but it remained for Kendall in 1914 to obtain the pure crystaline hormone, thyroxin. This substance, Kendall has shown, contains 65 per cent iodine. Every cell in the body needs thyroxin to function properly. Where the secretion is deficient the brain becomes sluggish, the various organs inactive, the skin thick and doughy, the hair falls out and in the advanced cases the individual approaches a vegetative existence. The administration of approximately one milligram of thyroxin daily or 15 grains of desiccated thyroid will transform this individual from this deplorable state into an active, alert personage.

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The deficiency of thyroxin secretion may be due, first, to congenital absence or afunction of the thyroid gland; second, to the removal of the thyroid; third, to destruction of the thyroid; fourth, to reduced activity of the thyroid; and, fifth, to an iodine deficiency.

The congenital absence or afunction of the thyroid results in cretinism and its removal or destruction in myxedema. With these conditions I shall not deal in this paper.

For the thyroid gland to properly function it must receive a sufficient amount of iodine. It has been estimated that the body needs approximately one-third of a milligram of thyroxin daily. As thyroxin is made up of 65 per cent of iodine, the thyroid gland must be furnished with approximately twenty-two one-hundredths of a milligram of iodine each day. The thyroid inactivity has a very close relationship to iodine deficiency.

A study of the adult patients, seen in the goiter clinic of the University of Oregon Medical School, shows that, regardless of the type of goiter, the vast majority give a very definite history of having had a preceding adolescent goiter. A smaller group is uncertain whether a goiter was present or not during the adolescent period, and only a very small group is positive that there was no goiter at that time. As we see many patients with goiter who are not cognizant of its presence until told by the physician, it is possible that many, if not all, of this latter group are in error and that in reality nearly all goiters in later life are preceded by an adolescent goiter. Kimball and Marine demonstrated in their work in Akron, Ohio, and observations elsewhere have confirmed their findings, that simple adolescent goiter is easily preventable by the use of iodine. For this reason we are of the opinion that probably all goiter, regardless of type, is due to a primary iodine deficiency.

Experimental work, of course, cannot be carried out upon the human, so that we must go to the work done upon animals for some of our observations. The giving of iodine to prevent goiter in fish, by Marine and Lenhardt, has been referred to. At that time it was thought by many that iodine in some way neutralized toxins in the body or aided the thyroid gland in producing a substance to neutralize the toxins, so that the giving of iodine prevented goiter, but the facts were that because of an iodine deficiency in the food intake the thyroid gland underwent certain changes in its attempt to respond to the demand thrown upon it when the chief ingredient of its secretion was lacking. The iodine in the food has no specific effect upon the thyroid gland and has but little influence upon a goiter that has already developed in the gland, but is merely a food substance, needed by the gland to produce its secretion.

Kalkus, working in the Methow Valley in Washington, where congenital goiter was so prevalent among animals that it was a menace to animal industry, showed that the congenital goiter varied directly with the iodine content of the food. He was able to produce goiterous kids or normal kids at will from the same does by either giving or withholding iodine during the pregnancy. The work of Kimball and Marine, at Akron, Ohio, demonstrated that, while goiter was not necessarily produced by the withholding of iodine from children, yet the majority of children whose parents refused to permit them to take the iodine developed goiter, while the children who took iodine did not develop it.

We have proof, however, that the withdrawal of iodine from the human diet results in the development of goiter. Indian tribes which were free from goiter when living upon a salmon diet which is rich in iodine, later, when they no longer had the salmon, developed goiter. This is direct evidence that the withdrawal of iodine from the diet of the human will result in goiter, the same as was shown by Kalkus in the work on animals.

There are, however, other factors besides the iodine content in the food that must be considered, namely: (1) iodine digestion, (2) iodine absorption and (3) iodine utilization by the thyroid. That this is a real problem is shown by the work of Hart and Steenback upon pigs at the University of Wisconsin. Pigs from the same litter were placed in two different pens, the diet of the two pens being exactly the same except in one pen roughage was given, while in the other pen it was witheld. The pigs need roughage in order to have proper intestinal action. The young from the pigs from which the roughage was withheld from the diet had congenital goiter, whereas the young from the pigs having roughage in the diet were perfectly normal. The iodine content of the food of the two groups of pigs was the same, but the group that did not have normal intestinal action probably did not get all of the iodine out of the food and, further, because of the improper intestinal action, toxic products, that caused a detrimental action upon the thyroid as well as upon other organs, were produced and absorbed. Thus a greater amount of thyroxin was required because of the toxic effect producing an abnormal cell activity in the body generally from a gland which may have had its activity reduced by these toxins.

All people are not the same. The organs of some individuals are weaker and more susceptible to outside influences or infection than are the organs of others, as for example some individuals, although otherwise healthy, are very susceptible to bronchial infection in certain localities; in other individuals the heart does not have the same reserve as in the normal individual, although he may be otherwise healthy. Likewise it is only fair to assume that the ability of the thyroid gland varies with different individuals. In the normal individual the supply of the iodine to the thyroid gland is utilized, whereas in other individuals born with a somewhat deficient thyroid gland it may not use the iodine so readily; hence, it must have a greater quantity of iodine. This probably explains why goiter is more prevalent in some families than in others.

If a woman has a goiter, although the thyroid may produce enough thyroxin ordinarily, during a pregnancy when a greater amount of thyroxin is needed there may be a deficiency. This may show up directly by the production of a congenital goiter, due to the thyroid of the fetus attempting to compensate for this deficiency, or it may be manifest by a weak thyroid gland in the child that later in life will develop a goiter more readily than in the normal individual. Another factor which may enter into the development of goiter is the probable difference of thyroxin needs of different individuals. It is certain that an active individual needs more thyroxin than one leading a sedentary life. There are many bodily variations that must make a difference in the thyroxin needed. The nervous, active individual would need more thyroxin than another individual leading the same kind of life, but who was less nervous.

The thyroid gland secretes two known substances: thyroxin, the active principal, and colloid, an inert substance that fills the acini and holds the thyroxin in suspension until it is needed. Were it not for the presence of the colloid to hold the thyroxin in suspension, there would be no thyroxin in reserve for an emergency. When the demand for a greater amount of thyroxin than it can produce is thrown upon the thyroid, the most common and normal response is an oversecretion of colloid, for the same cells produce both.

This oversecretion of colloid causes a distention of the acini and an enlargement of the thyroid gland which is known as colloid goiter. Notwithstanding the many contrary statements in the literature, it is the most frequent type of goiter that devleops at any given age. This is true in adult life. By this I do not mean that the majority of the patients having goiter at fifty years of age have colloid goiter, but I do mean that a majority of the goiters that develop at age fifty are colloid.

In the development of a colloid goiter, the walls of the acini are stretched, due to the increase of colloid within. This stretching of the walls changes the shape of the cells lining the acini from more or less cuboidal cells to broad, flat cells. The increased pressure within the acini, due to the increased amount of colloid, has a tendency to aggravate the cell distortion so that in extreme cases the cells become so flattened out that the protoplasm about the nuclei is thinner than the nuclei, causing a bulging of the cells. Cells of this type, because of their distortion and the pressure upon them, have an impeded function. This explains why that, although iodine given early would have resulted in a sufficient thyroxin secretion so that there would not have been an oversecretion of colloid and the flattening out of the cells, after the cells have become flattened out, their function reduced, or perhaps entirely suspended, the giving of iodine does not usually result in the increased production of thyroxin. To effect a cure in these cases these cells must be given a rest by the administration of thyroxin, usually in the form of desiccated thyroid.

I want to call your attention to the difference between giving iodine in a form in which the thyroid gland may utilize it in making thyroxin, and in giving the latter. Although thyroxin is 65 per cent iodine, its administration must not be considered as the administration of iodine, but as the administration of the finished hormone which gives the thyroid gland a rest. The giving of iodine to patients who have goiter does not give the thyroid a rest; it merely furnishes iodine upon which to work. In advanced cases of colloid goiter and even in many of the milder cases, the thyroid gland must be given a rest the same as an injured arm is given a rest, in order to enable healing. After the arm has healed, then active and passive motion restores function. Likewise the thyroid gland must be given a rest by the administration of thyroxin, and after the thyroid gland has become normal, then the giving of a sufficient amount of iodine in the diet will enable it to have the necessary iodine for the production of thyroxin so that it may remain a permanent normal gland.

The second change that takes place in the thyroid gland as a result of iodine deficiency is hyperplasia. Hyperplasia occurs in two forms, (1) the hyperplasia of cells and (2) the hyperplasia of acini. Hyperplasia of cells occurs in children and in the adolescents in whom the thyroid gland is growing along with other organs of the body as a simple goiter, that is, nontoxic. This hyperplasia microscopically does not differ materially from toxic hyperplasia or exophthalmic goiter. It is usually diffuse, but sometimes localized. A considerable portion of the nodules occurring in the neck of children and adolescents are not adenomata, but are simple localized hyperplasia.

It is doubtful if simple hyperplasia occurs in the adult. It seems that it is usually toxic. In the study of the cases in our clinic we have come to the conclusion that the toxic hyperplastic goiter should not be looked upon as an acute disease, but rather as a chronic disease with acute exacerbation. We believe that, while these patients are often exceedingly toxic, the condition is primarily due to an iodine deficiency.

Kendall is of the opinion that, although he has not been able to isolate the thyroxin of exophthalmic goiter, it is deficient by one atom of iodine and is more toxic than normal thyroxin. If this be true, it would explain why the patients on a given amount of iodine can become extremely toxic, because more thyroxin molecules deficient in iodine can be produced from the same amount of iodine than were produced when the thyroxin contained its full amount of iodine. Plummer, working on this hypothesis, gave the patients Lugol's solution and proved the theory. When these patients are given a sufficient amount of iodine in the form of Lugol's solution to transform the abnormal thyroxin to normal thyroxin and enable the gland to produce thereafter a normal thyroxin, improvement is immediate. A study of the thyroid glands of the toxic hyperplastic goiter patients who have been given iodine shows that it does not cure, as these glands retain definite evidence of the former hyperplasia, in that the acini are irregular and here and there can be seen the evidence of the former hyperplasia.

The other type of hyperplasia occurring as a result of iodine deficiency is that in which there is a production of new acini. This occurs as three different types; first, the adenoma; second, the adenomatosis or diffuse adenomatous goiter; third, compensatory hyperplasia. The first two are very similar because they both spring from the interacinar epithelial cells, but in the adenoma it develops as a localized growth, while in adenomatosis it develops as a diffuse growth, involving the entire gland. The acini form first as a fetal type and then take on the ability to secrete colloid, showing next a mixed type, in which some of the acini are fetal in type and some colloid and, third, the colloid type in which most of the acini contain colloid, but in which there are always some areas showing the undifferentiated cells and the fetal acini. The microscopic picture bears no relationship to the toxicity.

The compensatory hyperplasia springs from the cells lining the old acini in patients, in whom there has been hypothyroidism due to a colloid goiter usually, but sometimes from overdestruction in the stage of retrogression in exophthalmic goiter. The cells as a result of this stimulation revert back to the earlier undifferentiated type from which develop, first, the fetal acini, then the intermediate acini and lastly the colloid acini, exactly as occurs in adenoma and adenomatosis. The cells lining the newly formed acini remain dormant for a varying period of time, so that there is no evidence of hyperthyroidism until they begin to function. The giving of small doses of iodine over a period of time stimulates these dormant cells so that they assume the ability to secrete thyroxin. This explains the appearance of toxic symptoms after the use of iodized salt. The discontinuance of the use of the small amount of iodine does not check the secretion as a rule after the cells have become active. The giving of Lugol's solution to toxic patients of this group results in immediate improvement, but it must be given only for a short time.

CONCLUSIONS

1. Insufficient iodine intake is the cause of goiter.

2. Iodine is essential to thyroid function and should be included in the food intake. For this purpose we recommend the use of either iodized salt for both cooking and table use or the giving of ten milligrams of iodine per week, preferably in the form of a chocolate tablet.

3. Iodine is of but little value in the treatment of simple nontoxic goiter.

4. Lugol's solution is of great value in preparing patients for operation but its continued use is dangerous.

OPERATIVE CASES OF GOITER*

Thomas M. Joyce, M.D., F.A.C.S.
PORTLAND, ORE.

Review of a Series of Operative Cases at the Portland Medical Hospital Clinic

Toxic goiter is a surgical entity of prime importance in the Pacific Northwest. Some idea of the significance of goiter surgery in this city may be gained from the fact that at St. Vincent's Hospital there were, in 1924, 333 thyroidectomies out of a total of 2000 major operations. There were 12 deaths, giving a mortality of 3.6 per cent. In 1910 at the same hospital there were only 14 thyroidectomies, with 2 deaths, a mortality rate of 14 per cent. These statistics clearly show the rapidity with which thyroid surgery has advanced, paralleling in every way the progress in other fields of surgical endeavor.

Surgery of the appendix, although extensively practiced at a much earlier date, has progressed no further than goiter surgery. This statement is well supported by the following figures, taken from the records of the Boston City Hospital, as reported by Duggan[1] in the *Boston Medical and Surgical Journal.* In 1895 there were 82 cases of appendicitis treated, with a mortality of 20.7 per cent; in 1922 there were 913 cases treated, with a mortality rate of 3.1 per cent. It will be seen that goiter surgery is now comparable in mortality to surgery for appendicitis.

This remarkable advance may be attributed to two things: first, to an improvement in operative technic; and, second, to an intelligent preoperative and postoperative care.

Twenty-five years ago the profession at large had about the same conception of goiter as is now popular with the laity; that is, a goiter was either "inward" or "outward." Extensive study and research has long since evolved, however, a much more comprehensive division, so that today the surgeon is at liberty to choose any one of a number of excellent classifications as a foundation for his work. For the purposes of this paper we divide the subject of thyroid disease into its broad headings as follows: (1) simple goiter, (2) the adenomata, (3) hyperplastic or exophthalmic goiter, (4) malignant goiter, and (5) thyroiditis.

Clinically, the majority of cases can be readily placed under one of the above headings. There is, however, an occasional case in which the type or combination of types can be determined only by microscopic examination of the excised tissue. Nearly all goiters are complex in structure, but are classified according to their predominating characteristics. For example, a goiter clinically diagnosed as an adenoma may show upon pathologic examination distinct colloid or hyperplastic areas in addition to the adenomatous tissue which, in this case, makes up the bulk of the gland. A knowledge of this intricacy of structure renders an understanding of the variations in toxicity among the goiters of any type less difficult. The operative cases are nearly all to be found among toxic adenomata and the hyperplastic or exophthalmic goiters.

From June, 1920, to January, 1924, inclusive, 1292 goiter patients were seen at the Portland Medical Hospital Clinic; a total of 923 operations were performed with 22 deaths, a mortality of 2.3 per cent. Of these, 851 were thyroidectomies, 17 deaths resulting, giving a mortality rate of 1.9 per cent and 72 were ligations with 5 deaths, a 7 per cent mortality. Arranged in types the various mortality rates are as follows:

(*Read Only Totals*)

1. Resections upon exophthalmic goiters:

	1920	1921	1922	1923	1924	*Total*
No. of operations	23	71	57	42	93	286
No. of deaths........	0	0	3	1	3	7
Percentage of mortality	0	0	7	2.4	3.2	2.4

2. Ligations upon exophthalmic goiters:

	1920	1921	1922	1923	1924	*Total*
No. of operations	8	24	24	16	0	72
No. of deaths........	1	3	1	0	0	5
Percentage of mortality	12.5	12.5	4.1	0	0	7

3. Total exophthalmic goiters—resections and ligations:

	1920	1921	1922	1923	1924	*Total*
No. of operations	31	95	81	58	93	358
No. of deaths........	1	3	5	1	3	12
Percentage of mortality	3.2	3.1	6.1	1.7	3.2	3.3

4. Resections upon toxic adenomata:

	1920	1921	1922	1923	1924	*Total*
No. of operations	33	112	109	132	170	556
No. of deaths........	1	0	1	3	5	10
Percentage of mortality	3.3	0	0.9	2.2	2.9	1.8

5. Total goiters of all types—resections and ligations:

	1920	1921	1922	1923	1924	*Total*
No. of operations	64	207	192	196	264	923
No. of deaths........	2	3	5	4	8	22
Percentage of mortality	3.1	1.4	2.6	2.01	3.01	2.3

6. Total resections upon goiters of all types:

	1920	1921	1922	1923	1924	*Total*
No. of operations	56	183	168	180	264	851
No. of deaths........	1	0	4	4	8	17
Percentage of mortality	1.8	0	2.3	2.2	3	1.9

The mortality for toxic adenomata greatly increases with the duration of the disease. There were 117 cases of toxic adenomata of from one to five years duration with no deaths; 128 cases of from 5 to 10 years standing with 1 death, and 0.7 per cent mortality; 311 cases of from 10 to 47 years duration with 9 deaths, a mortality of 2.9 per cent.

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The highest operative mortality is found among the toxic adenomata of many years standing, in which there is degeneration of the heart musculature and associated auricular fibrillation. These are desperate cases which die if left alone, operation usually being submitted to as a last resort. In this series there were 32 such cases and 7 deaths, a mortality rate of 22 per cent. In some of those surviving the operation a break back to normal rhythm has been accomplished by the cautious use of quinidin, a number of years of comfortable life thus being insured. Could this class of patients be eliminated from the operative list, the mortality rate for thyroidectomy would be far less appalling.

During the period covered by this report 9 cases of malignancy were encountered. A total bilateral lobectomy was done in each instance with no operative mortality. Pathologic examination revealed carcinoma in every case. Two-thirds of these patients were dead within four years; one-third are still living; in one case five years has elapsed since the operation with no evidence of recurrence.

The etiology of thyroid disease is not thoroughly understood. It is, however, now generally accepted that iodine deficiency is an important causative factor. The isolation of thyroxin in 1914 by Kendall[2] remains to date the most important single step towards the solution of this difficult problem. Analysis of the thyroxin produced by an exophthalmic goiter has revealed the astonishing fact that the toxicity in Graves' disease is due not to an increased thyroxin production, but the secretion of a poisonous product differing from the normal thyroxin, in that its chemical formula contains one molecule of iodine less than is found in the formula for normal thyroxin. This observation is clinically substantiated by the favorable results obtained with Lugol's solution in exophthalmic goiter.

In 923 operative cases more than 80 per cent were women, 80 per cent of whom were married. Twenty-five per cent of the women first noticed their goiter at puberty; 4 per cent during or following pregnancy, and 6 per cent at the menopause.

The average age at operation for hyperplastic goiters was 44 years for men and 33 years for women; for toxic adenomata, 46 years for men and 45 years for women. The youngest hyperplastic goiter operated upon was 6 years old, the oldest 67. The youngest adenoma was 12 and the oldest 76.

The average duration of the disease prior to operation for hyperplastic goiters was 2.4 years; for toxic adenomata, 16 years. One woman gave a history of having had a large goiter for 47 years, yet at the time of her operation her symptoms were due largely to the size of the gland, very little evidence of toxicity being found. This is, of course, unusual, toxic symptoms nearly always manifesting themselves in a few years.

The diagnosis of goiter is made upon the symptoms and physical findings, most important of which are the following: (1) enlargement of the thyroid gland, (2) tachycardia, (3) nervousness, (4) tremor, (5) dyspnea, (6) loss of weight, (7) loss of strength, (8) profuse sweating, (9) choking or pressure sensations, (10) emotional instability, (11) gastrointestinal symptoms, such as diarrhea, nausea and vomiting, (12) exophthalmos, and (13) loss or change of voice from pressure paralysis of the vocal cords. Enlargement per se may cause loss of voice and other pressure signs; all other symptoms here mentioned are evidence of toxicity. Many other minor points might be mentioned, but those listed are cardinal.

It is hardly necessary to dwell on the points of differentiating the various types of goiter, but attention should be called to a few of the characteristics of the fetal adenoma, because of its frequent toxicity and its liability to malignant degeneration. It has been estimated by pathologists that 90 per cent of the thyroid cancers develop from the toxic adenomata, particularly from the fetal type. This tumor is nearly always single. It is very hard, is freely movable, and is quite round and smooth in outline. It varies in size, but its usual dimensions are somewhere between those of a walnut and those of an orange. With these few points in mind, a clinical diagnosis may be made in a majority of the cases examined. In 851 thyroidectomies the pathologist has reported 556 to be adenomata, 32 of which were fetal in character. These figures show that the fetal adenomata make up about 6 per cent of all the adenomatous forms and, therefore, are frequent enough to be of importance.

With regard to therapy goiters may be divided into three groups, namely, (1) those which require no treatment, (2) those which can be treated medically, and (3) those in which treatment by medicine and surgery is indicated.

In the first group are placed simple goiters in adults and nontoxic adenomata, providing these are not causing symptoms due to their size. It is good surgery, however, to remove nontoxic adenomata as a prophylactic measure, since later they nearly always become toxic. Either of these types may be removed for cosmetic reasons.

In the second group are the simple goiters of puberty, the so-called adolescent goiters, and the rare cases of thyroiditis. The adolescent type is treated in our hands by small doses of Lugol's solution, a few drops daily during two weeks of every month being the usual routine. Thyroiditis, as the name implies, is an acute inflammation. It is nearly always associated with inflammation of the tonsils or sinuses. We have had three such cases which promptly cleared up under general treatment.

The third group includes the hyperplastic goiters, the toxic adenomata and the malignancies. Treatment of hyperplastic goiters has undergone great changes since the introduction of Lugol's solution in this field. Preparation prior to operation now consists of bed rest, and the administration of Lugol's solution in drop doses daily. Upon this regimen most of the patients will be in condition for operation in from three days to a week, the pulse dropping from 120 or above well down below 100. The basal metabolic rate shows a similar drop, but although this test is used routinely, more reliance is placed upon the pulse rate and the general condition of the patient.

There are a few desperate exophthalmic patients who cannot be thus controlled. These frequently are unable to retain fluids, vomit continuously, and show a persistent high pulse rate. It is is here that the use of glucose and insulin is of such value. We have been giving patients of this type 500 c.c. of 5 per cent glucose solution intravenously, with 10 units of insulin, two or three times a day. This provides sufficient fluid and nourishment to tide the individual over a crisis; as a matter of fact, with no other food a patient may thus be kept alive about ten days. It is essential to provide these patients with iodine and, since the incessant vomiting renders oral administration impracticable, other means of introduction must be sought. Iodine in the form of Lugol's solution may be placed in the Murphy drip or may be injected directly into a vein as sodium iodide. In a crisis the injection of one 30 grain ampule of this latter compound is almost specific and usually within a few hours the vomiting ceases. It is well to begin the oral use of Lugol's solution as soon as possible, however, for the intravenous iodine preparations are rapidly excreted from the body. A ligation of a superior pole is next attempted, followed a week later by a second ligation. Resection is not tried until the pulse is 100 or below and the general condition is improved. Lugol's solution in our hands has greatly reduced the number of ligations so that now it is a rare operation. It cannot be completely disregarded, however, still being indicated in cases of toxicity uncontrollable by the usual methods.

Preoperative care is just as essential in the toxic adenomata. Bed rest and the use of digitalis are very important, and opiates are freely employed to insure quiet. Where the heart is decompensated and generalized edema is present, the fluid intake is restricted to about 800 c.c. per day; this with the use of digitalis and saline cathartics quickly controls the waterlogged condition. Such patients are not operated upon until compensation is regained. Iodine in any form is contraindicated and ligation is of no value in this type of case.

Plummer,[3] of the Mayo Clinic, recently conductan interesting experiment which might be mentioned here. Two series of toxic adenomata were observed. One of these received the standard treatment, similar to that just described, including digitalis. The other group was treated in the same manner but no digitalis was administered, prolonged rest in bed being substituted. In the first series with digitalis the usual mortality, about 2 per cent, was obtained. We were, however, greatly surprised to learn that in the group without digitalis there were no deaths. We are anxiously awaiting Plummer's final conclusions in regard to this matter, but meanwhile have continued our use of digitalis.

Malignant goiters receive the same preoperative care as do toxic adenomata. Needless to say, malignancies are operated upon as soon as practicable. A small adenoma of stony hardness should always arouse suspicion of cancer, as in nearly all of our carcinomatous goiters this was the type of gland observed.

The operation for hyperplastic goiter and toxic adenoma is similar, but rather more of the gland is removed in the hyperplastic type. We have found that the exophthalmic patient who develops a slight hypothyroidism subsequent to operation eventually obtains the most satisfactory result. The fetal adenoma must be completely enucleated or a recurrence will invariably follow. When malignancy is found, complete extirpation of the gland must be done and radium or roentgen ray may be used following.

There are many accidents to be expected in thyroid surgery, most of which require minor operative procedures for correction. An occasional patient will hemorrhage, necessitating reopening of the wound and ligation of the bleeding. The danger here is not so much from loss of blood as from the pressure of the blood clot upon the trachea. The most serious type of hemorrhage is that which results from slipping of the ligature on the inferior thyroid vessels. Retraction of the bleeding points into the mediastinum may result in fatal, uncontrollable loss of blood. We now obviate this danger by transfixing the large vessels before tying. In 851 thyroidectomies the wound was reopened 12 times, or in 1.2 per cent because of hemorrhage. In 6 cases oozing was so difficult to control that the wound was left open and packed, closure being completed the next day. While these figures are slightly alarming, it is somewhat encouraging here to recall that of the entire number only one death was directly due to hemorrhage and shock.

Injury to the parathyroids may occur in rare instances. Tetany will follow this mishap, but can be controlled by the use of parathyroid tablets. If the parathyroid bodies are seriously damaged, the patient must take these tablets over a prolonged period of time, even for life. If this is done, no serious inconvenience will be experienced by the patient. There were three cases of postoperative tetany observed in this series, two of which were of but short duration. One case was rather persistent, showing slight symptoms of tetany several months after the operation, whenever the parathyroid tablets were discontinued.

Injury to the trachea is sometimes reported. Immediate suture will remedy this accident if it occurs. Fortunately we have never experienced this mishap.

Collapse of the trachea may follow the removal of a large adenoma, which by its constant presssure has resulted in tortion or flattening. This is an extreme emergency which appears soon after operation or not at all. It occurs infrequently, but demands immediate tracheotomy or intubation, or death will invariably result. We have made it a practice in cases showing marked tracheal distortion to have a large catheter, a mouth gag, and a few instruments necessary for the performance of a tracheotomy at the bedside.

Injury to the recurrent laryngeal nerve is a serious misfortune. Where both nerves are destroyed bilateral adductor paralysis results, the vocal cords assuming a constant position of adduction, leaving insufficient breathing space. An intense dyspnea follows, which unless relieved will go on to a severe bronchitis and death. Frazier reported twelve such cases upon which he had operated, anastomising the severed end of the recurrent laryngeal nerve to the descendant hypoglossal nerve. At least a partial restoration of function with resultant diminution of dyspnea was obtained in his cases; in some the outcome was nearly perfect.

Recently such a patient came into our hands. She had been operated upon elsewhere, both recurrent laryngeal nerves being caught in sutures at the time of her former thyroidectomy. A tracheotomy was performed to temporarily relieve her dyspnea, which was horrible to observe. We performed the operation described by Frazier without difficulty, and although the patient must still wear her tracheotomy tube, unquestionable cord movement has been noted on the side anastomosed. Her voice, which prior to operation was a hoarse whisper, is now practically normal. We hope, of course, for further improvement so that she may discontinue the use of the tracheotomy tube.

The cause of death in thyroid surgery is largely referrable to the heart. Our 22 deaths are tabulated as follows:

Thyrotoxicoses with extreme tachycardia	12 deaths
Heart failure, dilatation of the heart	3 deaths
Pulmonary edema	1 death
Embolism	1 death
Thrombosis of internal carotid artery	1 death
Lobar pneumonia	1 death
Collapse of trachea	1 death
Shock and loss of blood	1 death
Acidosis	1 death
TOTAL	22 deaths

Two and eight-tenths per cent of the patients upon whom we have operated have had former thyroidectomies. This is an unusually high percentage of recurrences, due no doubt to the popularity of single lobe resection a few years ago. There have been thirteen operations for recurrent adenomata and eleven for recurrent hyperplastic goiters. This proves the rate of recurrence to be 2.3 per cent for adenomata, and 3.8 per cent for exophthalmic goiters. As far as we have been able to tell, the rate of recurrence in patients upon whom we have performed the first operation is but a small fraction of one per cent.

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APPLICATIONS OF PHYSIOTHERAPY*

Clarence A. Smith, M.D.
SEATTLE, WASH.

The adoption of physical methods by government medical authorities during the World War for the treatment of certain diseased conditions served to emphasize the efficacy of this form of therapy and to confirm its use by the medical profession. The comprehensive term physiotherpay has been employed to include physical measures embraced under electrotherapy, heliotherapy, actinotherapy, hydrotherapy, mechanotherapy and massage. While all of these methods are applicable for treatment in hospitals and clinics, they are not all feasible for use in the average physician's office practice. The methods which for the most part are fit for this purpose are included under the designation electrotherapy, and it is to these that your attention will be directed.

While the electric current is the motive force in the various forms of apparatus employed, and some of the latter produce constitutional effects in the promotion of metabolism, improved circulation and general well-being, the distinctive results obtained by each method of treatment are dependent upon mechanical or other secondary applications induced by the current. We will discuss a few of these somewhat in detail, while the limitation of time will require only a cursory consideration of others. This will be followed by the presentation of a few case reports, which will illustrate some of the applications of the physical methods under consideration.

Static electricity was the first form employed in the treatment of disease. Discovered about 1675, records are extant of its employment in the treatment of diseased muscles and nerves during a period of about seventy-five years. The subsequent discovery of galvanism and faradism supplanted the use of the static current, and little was known of it in this capacity until about thirty years ago, when its uses and applications were revived and amplified by Morton and his coworkers.

This current is generated by glass plates revolving between stationary plates. Its distinctive characteristic is minimum of amperage with high voltage, so that a small volume of current accomplishes effective results. When directed to the tissues of the body, it produces cellular contraction in the parts to which it is applied, the depth of action depending upon the voltage, which in turn is determined by the number of plates in the machine. Its efficacy in treatment is based on the fact that inflammation, whether produced by trauma or infection, is accompanied by an exudate of serum or blood which produces edema or swelling, the pressure of which on terminal nerve fibers causes pain for which the patient consults his physician. When this edema is reduced the pain is relieved.

The physical action of the static current in these conditions consists of a mechanical contraction or squeezing of cells which forces out the exudate, thus relieving the pressure on nerve filaments. This is in reality a cellular massage, the extent of which is determined by the strength of the current. This result is obtainable in muscles, nerves and other tissues which are thus affected by an exudate with subsequent edema. In acute inflammatory conditions relief is ofttimes immediate, sometimes with startling results. In chronic cases, accompanied by long standing, organized exudate, a series of treatments in connection with other physical measures is necessary to obtain permanent relief.

The static wave current is applied to the affected part by means of a block tin electrode, attached by a cord to the positive pole of the machine. Cellular massage is produced in the tissues covered by this electrode. By means of a brass ball on a hard rubber handle the current is applied in a concentrated form, termed static sparks, which is an effective supplement to the previous form of application. A wooden rod, with asbestos core and brass tip, is employed to produce a shower of fine sparks, known as brush discharge or blue pencil, from the color presented by the sparks in the dark. This applies delicate massage to the affected part.

Each of these forms of current has its particular application, as will be shown later. Pathologic conditions to which the static current is applicable include acute and chronic myositis, such as lumbago, muscular sprains and traumatism; neuritis as represented by sciatica, brachial plexus and other nerve inflammations; sprains and inflammations of joints and periarthritis. Special rectal and vaginal electrodes are prepared by which inflammations of the prostate and uterus are relieved by cellular massage. It is readily appreciated that the presence of pus is a contraindication to use of this modality, since its massage might lead to dissemination of the pus.

The most widely used form of electricity is the high frequency current in the application known as diathermy. The commercial alternating current of 110 volts and 60 cycles, or 120 oscillations per second, is passed through the apparatus which raises the voltage with a decrease of amperage, and increases the oscillation to about 1,000,000 per second. When this high frequency current passes through the body, the only sensation is that of heat, resulting from the resistance of the tissues to this rapidly oscillating current. If block tin electrodes of equal size are applied to opposite sides of the body or an extremity, the greatest concentration of heat will be half way between them. If one is made smaller, the more intense heat is nearer to it. By the selection of suitable sizes of electrodes, heat can be concentrated in any organ or portion of the body desired.

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The beneficial effects of heat for the relief of surface inflammation is a matter of common knowledge. The resulting hyperemia, with the increase of leucocytes and phagocytes, removes the products of inflammation and promotes the restoration of the affected part to normal. The employment of diathermy produces like results in the interior of the body, whereby there is a reduction of congestion and edema of the inflamed organ with consequent relief of pain. This form of therapy, being harmless in its nature, is applicable to inflammation in any part of the body, the only vital contraindication being the existence of confined pus. This being evacuated, diathermy aids in restoration to normal.

With these principles in mind one can appreciate the extensive possibilities of this form of therapy. Whether pathology be acute or chronic, it is subject to relief by this modality. All forms of inflammation of muscles, nerves and joints are benefited by proper application of heat from this source.

Of late much has been published concerning the use of diathermy in the treatment of pneumonia. Stewart has presented a large group of cases from his own practice as well as those of other physicians who are unanimous in its commendation. While duration of the disease does not appear to be materially shortened, there is a diminution of cyanosis and dyspnea, gradual reduction of temperature and relief of most of the distressing symptoms. Stewart reports a mortality of about 26 per cent as compared with about 42 per cent with other methods of treatment. Other forms of pulmonary pathology are amenable to its application, such as empyema after the evacuation of pus, some forms of bronchitis, asthma and other inflammatory conditions. Some writers claim benefit in certain conditions of tuberculous infection.

Many forms of abdominal inflammation can be relieved by the application of this agency. One must use discrimination and not expect unwarranted results in cases where surgery is demanded, but its judicious use may frequently cure or relieve conditions which at first thought one might consider wholly within the realm of surgery. This is particularly applicable to pelvic inflammatory conditions. Many reports have been received, attesting the curative results from the use of diathermy in inflammations of the uterus, tubes and ovaries, where surgery had perhaps been emphasized as the only means of relief.

In pelvic inflammation the technic may call for block tin electrodes over the lower abdomen and beneath the pelvis, or in place of the latter may be substituted a suitable vaginal electrode which will concentrate the heat more accurately in the affected organ. A similar technic is helpful in certain forms of inflammation in prostate and vesicles, a suitable electrode being introduced into the rectum with a block tin electrode over the lower abdomen. Many other technics could be mentioned for the treatment of inflammatory conditions of abdominal organs.

In this discussion reference should be made to the constitutional effects of the high frequency current. This has been mentioned by many writers who have noted an improved condition of the metabolism, lowered blood pressure and general constitutional benefit from the passage through the system of this current. The relief in nervous and irritable conditions in some patients has often been observed. These results, however, are usually secondary to employment of the high frequency current for local conditions.

Attention should be called also to what is termed surgical diathermy. If one block tin electrode, say 4 by 6 inches, is employed and the other supplanted by a needle, one can readily appreciate that a tremendous degree of heat will be concentrated beneath the point of the needle. This differs from the electric cautery in that the needle itself is not heated except as it is affected by the heat from the tissues of the body, to which it is applied. Hence cauterizing and cicatricial effects are not produced. This heat is employed for the destruction of such pathologic conditions as moles, warts, nonvascular nevi and some forms of malignancy.

The removal of malignancy by surgical diathermy presents peculiar advantages. By reason of the intense heat produced, the possibility of metastasis from the operation is eliminated. The growth is entirely removed at one sitting, directly limited to the area desired by the operator. After removal of epithelioma the affected surface is soon covered by normal skin with no resulting scar. This method is particularly adapted for treatment of cancer of the tongue, jaws and floor of the mouth. Growths can be removed to any extent desired, with no hemorrhage and a minimum of deformity. This is equally true in treatment of malignancy in the bladder, vagina and rectum.

This procedure is also available for office treatment of hemorrhoids which are removed under local anesthesia with minimum discomfort for the patient and little or no detention from business. There are ardent advocates of electrocoagulation for treatment of tonsillar pathology and equally earnest opponents of this. One should be cautious in selection of cases for this method, with appreciation of possible embarrassing sequelæ.

The usefulness of radiant heat from the therapeutic lamp for the relief of inflammation has long been recognized. While the penetrative power of this form of heat is limited, its beneficial results are due to hyperemia with accompanying accession of blood, leucocytes and phagocytes at the site of inflammation. The resultant relief of pain is striking in many cases. While most satisfactory results are obtained in combination with other modalities, relief in many cases is obtained by its use alone. Many conditions of myositis, neuritis, periarthritis and arthritis are benefited from its use. One of the most gratifying applications is in inflammation of the sinuses, rhinitis and otitis media. Personal experience with its use in these conditions is necessary to convince one of the striking results often obtained in these conditions.

For the treatment of muscular pathology, the galvanic and sinusoidal currents are indispensable, both for diagnosis and therapy. The sinusoidal current is based on the principle of the alternating cycle of postive and negative phases of a unidirectional current. The different forms of rapid, slow and surging sines are determined by the frequency and rhythm of the alternating phases. Paralyzed and fibrosed muscles, from disease or injury, are greatly aided in restoration to a normal state by the judicious use of this modality. Judgment is needed in selection of the particular form of this current and the duration of its application.

In combination with diathermy the suitable sinusoidal current is particularly helpful in stiffened joints, resulting from injuries and consequent immobilization. Preceded by diathermy the massage effect is many times of great benefit in old prostatic cases. In all these applications one must employ discretion in the selection of cases for such treatment.

In certain forms of uterine pathology the galvanic current is particularly valuable. This applies especially to some cases of cervicitis with accompanying leucorrhea and cases of endometritis. Certain cases of idiopathic menorrhagia, uncontrolled by other methods, can be checked by the galvanic current.

Circumstances are not suitable at this time for a satisfactory discussion of actinotherapy, which would demand a complete paper for its proper consideration. The ultraviolet ray, generated by a current passed through the mercury quartz tube, is one of the most useful agencies in this class of work. The air-cooled apparatus, being essentially biologic in its effects, is most beneficial in regenerating anemic, asthenic and depleted classes of patients. Its useful employment for local conditions also has a wide field of application. An enumeration of the conditions of disease which may be benefited by this modality, according to the opinions of some writers, would include a large proportion of the ills to which the human flesh is heir. I will not attempt to specify the distinct pathology in which the ultraviolet is most applicable in consequence of time limitation. It is apparent, however exaggerated may appear the claims of its widespread usefulness, that there are many conditions which will be greatly benefited by its use.

The water-cooled ray, being bactericidal in its effect, has a wide application in the destruction of bacteria and consequent relief of pathology incited by their presence. Many forms of infection, a variety of skin diseases and other conditions are benefited by this modality.

While effective results are obtainable from the use of each modality in its own particular field of action, ordinarily most satisfaction is obtained by a combination of two or more. One soon learns from practical experience the combinations most useful in a given case. These applications will be illustrated in case reports which follow.

I wish to offer a protest against the traditional methods of treating inflammation and injuries of joints and muscles. This includes special stress laid upon rest and immobilization, supplemented by local applications of heat and other remedies. This is advised during the period of pain and inflammation, to be followed by passive motions. During this period symptoms are manifested by the presence of an exudate, whose swelling produces the pain for which the patient desires relief. Oftentimes one observes the termination of this treatment to be accompanied by stiffness and disability, at times of long duration. If the treatment outlined above is begun immediately after the infliction of injury or inflammation, for the purpose of reducing the exudate and preventing its reaching a chronic stage, recovery can be expected in many cases within a period of days instead of weeks or months. Long periods of disability, and in some cases of partial permanent disability, can be obviated by the application of the physical measures already outlined.

The following case reports illustrate the principles which have been described, and demonstrate some of the conditions to which they are applicable.

Case 1. N. F., 32 years, pipe fitter, called at office on the morning of August 13, 1925, stating that he had injured right elbow the previous afternoon. He had suffered extreme pain, enabling him to sleep but little during the night. He had been unable to move his elbow on account of severe pain. Examination disclosed marked, tense swelling about the olecranon, painful to pressure. The arm was held rigid a little beyond right angle without extension or flexion.

The treatment consisted of applying radiant heat to the elbow for a half hour from the therapeutic lamp to the point of tolerance, the patient sleeping profoundly during its application. This was followed by the static brush discharge and static sparks over the site of inflammation. At the end of treatment he declared the pain much relieved, and there was a little motion in the elbow. The following morning he said he had slept all night and had been free from pain. He received four daily treatments, at the end of which time he said he should return to work. When I saw him several months later, he said he had not missed a day from work.

This was a case of periarthritis. The radiant heat served to lessen inflammation through the effect of hyperemia and the static current reduced the exudate, thereby relieving pain.

Case 2. C. R. limped into the office in a very distressing manner September 20, 1925. The previous evening he had sprained his knee while dancing. All motions of the leg produced severe pain. Examination disclosed a painful area on the outer side of the joint, pain being produced by movements and pressure over this area.

This case, like the preceding, was one of periarthritis. It was treated with radiant heat to a degree of tolerance for twenty minutes, followed by static wave current applied over the affected area with block tin electrode for twenty minutes and then static sparks. The treatment relieved pain and enabled him to walk with more ease. The same treatment was given on the two following days, at the end of which time he was entirely free from pain and his gait was natural.

Case 3. A. N., 19 years, university student. He limped into the office February 19, 1925, stating he had sprained his ankle the previous evening while playing basket ball. Examination disclosed an average degree of sprain with the usual swelling about and beneath the malleolus, the most sensitive point to pressure being about an inch above the tip.

After the x ray exposure excluded fracture, the inflamed area was treated with static brush discharge and static sparks. At the end of fifteen minutes the patient was greatly astonished to find he could walk without limp and without pain. This treatment was repeated the two following days, nothing else being done for him. He did not return for further treatment. He informed me later this was due to the fact of his being entirely well.

Case 4. G. A. H., 35 years, lumberman, February 10, 1926, fell on extended arms, dislocating left shoulder. The arm was bound to the side for ten days and he was then cautioned not to use it for fear of redislocation. He appeared for treatment February 27. The arm could be abducted to about forty-five degrees and hand could be raised only to chin. All movements were accompanied by pain which was especially severe at night.

Treatment consisted of diathermy with various technics for reduction of inflammation, followed by static wave current and sparks to produce disappearance of exudate. Later was added the surging sinusoidal current for the relief of adhesions. Treatments were followed by forcible manipulation of shoulder joint, with instructions for similar home treatments. During seven weeks he received twenty-one treatments. The arm could then be raised nearly to the perpendicular without pain. He was able to resume his beloved golf, but stated he played a rotten game.

Case 5. H. L. C., 63 years, carpenter. October 16, 1925, he fell from second floor to basement. In falling he grasped a 2 by 4 timber with both hands which struck the ground first, thus breaking the fall and preventing fractures or dislocations. His main injuries affected the shoulder joints, pectoral and scapular muscles. His treatment had consisted of continuous rest of arms, application of liniments and heat.

When he came for treatment, December 31, he could not raise the arms to horizontal. All movements were accompanied by severe pain which he stated had been continuous since the injury, being worse at night, causing great loss of sleep. During this period he had lost about twenty pounds in weight. He had many decayed teeth with pyorrhea, for which all the teeth were extracted.

The same treatment was followed as cited above, diathermy, static, surging sinusoidal, manipulation. After about six treatments pain was relieved, especially at night. After three weeks right arm could be raised to perpendicular. During six months he received forty-five treatments. Pain existed at times but motion of both arms was nearly normal.

Case 6. M. S. W., 51 years, logger. August 27, 1925, was struck by a log on the inner surface of the left knee. He came for treatment March 4, 1926. During these six months he had been unable to work in consequence of pain in knee which was continuous, being worse at night. Pain was located at the inner surface of the knee joint, whose circumference was one-half inch more than the other. He was able to walk on the surface with difficulty but going up and down stairs was particularly distressing.

Treatment consisted of diathermy and static applications to the knee. After four or five treatments pain was greatly reduced and all forms of walking were easier. During six weeks he received fifteen treatments, when he declared pain was gone, all motions were normal and he resumed work.

This case had been diagnosed as fracture or dislocation of internal semilunar cartilage, for which operative procedure was advised. This diagnosis must have been inaccurate, since this condition would not have been relieved by the course of treatment administered.

Case 7. Mrs. S. R., 33 years, grocer, was referred for treatment March 23, 1926. For two months she had suffered from pain in left lumbar region, recently of increased severity. She presented characteristic symptoms of lumbago. Was unable to work on account of lower back pain from any exertion. While rising in morning it was necessary to roll over on her face in order to get out of bed.

Treatment consisted of diathermy over affected lumber region, followed by static wave current and sparks. After the second treatment she declared she was "running like a new Ford." After third treatment she resumed work and several months later informed me she was entirely well and had had no more pain.

Case 8. C. E. H., 57 years, clergyman. December 28, 1924, he was in an automobile which rolled over a bank. He sustained no fractures but injuries to the right shoulder and arm, with many contusions. He developed neuritis of the arm and hand which confined him to the house for three months. He consulted me August 13, 1925, eight months after the injury. Shoulder and arm had recovered and his present trouble was confined to the right hand which was swollen, the skin being tense and glistening. The grasp was weak and accompanied by pain. The thumb and index finger were rigid with very little extension and flexion on account of pain. He could not hold a pen. Pain was severe while at rest, especially at night.

Treatment consisted of radiant heat, followed by diathermy, one electrode about the arm above the wrist and the fingers in a saline solution, in which was placed the other electrode. Static sparks were applied to thumb and index finger. After the second treatment he stated this had given more relief than anything that had been done since the injury. After the fourth treatment he could hold a pen between thumb and forefinger. During four weeks he received seventeen treatments. He could use the hand for ordinary purposes, although it was still weak but free from pain.

Case 9. A. E. S., 32 years, truck driver. September 29, 1925, fell on a timber, striking in the region of the left sacroiliac joint. Severe pain was continuous on exercise, disabling him from any exertion. He was in hospital a week and on crutches two weeks following injury. Was referred for treatment October 30. During previous month he lost twenty pounds in weight. Examination disclosed acute pain in region of left sacroiliac and at the sciatic notch, extending along course of the sciatic nerve in the thigh.

Treatment consisted of diathermy applied to left sacroiliac region, static wave current in this locality and over sciatic notch, with static sparks over the pelvis and down the back of the leg. After five treatments pain in sacroiliac region was greatly reduced. He was able to split wood and do other work at home. During two months he received sixteen treatments, at the end of which time he declared himself free from pain and resumed work.

This case had been diagnosed as sacroiliac subluxation and suitable treatment recommended. This diagnosis must have been incorect, since this condition would not have yielded to this form of treatment.

Case 10. This was a personal experience. One morning I suffered from rhinitis with the usual inflammatory symptoms of nasal mucous membrane, pharyngitis with painful deglutition, oppression and feeling of weight in upper part of chest. On going to the office the nurse applied large electrodes over the upper part of the chest and corresponding area in the back, giving diathermy heat to the point of tolerance. Radiant heat from a therapeutic lamp was at the same time reflected in the face with as much heat as could be borne. This treatment continued for an hour, at the end of which time all the above mentioned symptoms had disappeared. The usual cough, which experience had shown always followed these symptoms, did not materialize.

Case 11. W. B. A., 15 years, high school student, consulted me August 21, 1925. While picking fruit he lacerated left hand against barbed wire. Infection resulted on palmar surface near ulnar border. The injury occurred seven days previously. The hand was greatly swollen, red and painful. There was a little pus in the wound. Red lymphatics extended above elbow; axillary glands were enlarged and painful.

Treatment consisted of radiant heat from therapeutic lamp directed for fifteen minutes on the dorsal and palmar surfaces. Diathermy was given with one electrode about arm above the wrist, with fingers in saline solution, in which was placed the other electrode. The first day he had a treatment morning and afternoon. The following day he stated pain was gone from hand and axilla, and swelling was less. The same treatment was given for three days, making five treatments in all, at the end of which time his hand was in normal condition.

Case 12. Mrs. F. W. A., 48 years, in charge of a department in a large store. In 1909 I attended her for an attack of catarrhal jaundice which was treated expectantly, after she had declined surgical treatment which had been advised for gallstones, which diagnosis appeared to have been incorrect. Since then she has had an occasional pain in the gallbladder region. The present attack had persisted for several days with constant pain in the gallbladder area without paroxysms of pain and no gastric symptoms. Examination disclosed rigid muscles over the gallbladder, very tender on pressure, temperature 102°, pulse 120.

It was explained that surgery is commonly recommended for acute cholecystitis which she declined to consider. She was given a hypodermic of morphin and hot applications advised. She called at the office two days later with temperature of 99°. The pain had continued, being present most of the time.

Treatment consisted of diathermy with one electrode over the gallbladder region and the other in a corresponding position on the back, heat given to the extent of tolerance. After two or three treatments subjective pain had entirely disappeared and deeper pressure was necessary to produce pain. Ten treatments were given during two weeks, when she declared herself well. It was necessary to make deep pressure to obtain any degree of sensitiveness. Inquiry ten months later disclosed that she had had no recurrence.

Case 13. Mrs. S. C., 20 years, housewife. Was married two years before consulting me, May 11, 1926. When she was pregnant about two months she was aborted. Pelvic pain began shortly afterwards and continued to this time. She had had various forms of treatment and had been advised that surgery was necessary to relieve retroversion, which was asserted to be the cause of her pain. She was wearing a pessary for that condition when she came for treatment. She had a profuse leucorrhea, which was one of the chief annoyances. This began soon after marriage and was much worse after the abortion.

Examination disclosed retroversion. There was tenderness on pressure at the fundus, the cervix was drawn to the left, there was thickening in the left broad ligament and pain on pressure. She also complained of pain in the right ovary.

Treatment consisted of diathermy applied with vaginal electrode beneath the cervix, with block tin electrode over the lower abdomen. This was repeated two or three times weekly. For the leucorrhea the galvanic current was used with positive copper-tipped electrode in the cervix, the pad over the lower abdomen being connected with negative pole. This treatment continued for ten minutes. Immediate result was a bloody discharge for about two days with much uterine pain. Following this the leucorrhea was entirely relieved, with no recurrence thus far. The pelvic pain has also been entirely relieved.

Case 14. C. R. G., 70 years, clergyman. He presented himself with a number of small senile warts on the cheeks and in the scalp. On the forehead, near the hair, was one about an inch in diameter, greenish black in color, in marked contrast to his white hair. This had been increasing in size for about ten years. Under novocain anesthesia this was removed by desiccation. After a month the surface was covered with normal skin, pinkish in color, which a little later could not be distinguished from the rest of the skin.

Case 15. Baby girl was born with a nevus at the border of the ribs in the left nipple line. It was about two inches in diameter, dark red in color, of cauliflower appearance. Beneath the left clavicle was another, about one-half inch in diameter. I assured the mother this would do the baby no harm and might be removed later if thought desirable. When the baby was six months old, however, the mother could endure it no longer and asked for its removal.

The baby was given sufficient ether for the injection of one per cent novocain salution, since ether vapor is explosive in presence of the spark. The growth was removed by desiccation, as was the smaller one. After a few weeks the area was covered with normal appearing skin except for the presence of a few red dots of pin-point size which can be readily removed if desired.

Case 16. J. M. H., 63 years, life insurance agent. Was referred for treatment March 19, 1926. He had an epithelioma involving about two-thirds of the anterior surface of the right ear and the auditory canal to the tympanum. It began eighteen years ago with a scale at the auditory meatus. For several years there has been a very sanguineo-purulent, offensive discharge, requiring constant use of pads day and night. He received various forms of treatment from many physicians. Dr. Klemptner referred him for electrocoagulation.

Previous to operation he was given two injections of morphin and hyoscin, followed by sufficient ether for complete anesthesia. The growth was coagulated well into the cartilage and in the auditory canal to the tympanum. Subsequent treatment consisted of daily applications of radiant heat and ultraviolet for the purpose of reducing inflammation and stimulating granulations. At the end of ten days the slough had disappeared and the affected area was covered with healthy granulations. To this were applied skin grafts, as well as to the canal for a short distance. The final result shows the ear covered with skin of normal appearance. There has been a problem to prevent the canal from closing in consequence of profuse granulations. There has been no evidence of epitheliomatous tissue and the canal will probably be permitted to close, as the tympanum has been destroyed.

By no means do these cases represent all conditions of disease, to which these forms of therapy are applicable. They do, however, suggest therapeutic resources, available to anyone who will devote time for acquiring the necessary knowledge concerning their details, by the use of which he can secure results, unattainable by other methods of treatment.

SEX PROBLEMS IN CHILDREN

WITH PARTICULAR REFERENCE TO MASTURBATION*

Henry M. Grant, B.A.
PORTLAND, ORE.

It is a real pleasure, at the close of my activities in Oregon, to appear before this society and give you some conclusions drawn from eight years in the field of sex education. I do not flatter myself that I can give any final answers to the many questions involved but I come with the hope that the material presented will be worth your serious consideration.

It is not my purpose to try to tell a group of physicians anything about their business. My remarks will be confined strictly to the educational and sociologic phases of sex problems. Questions in this field, while not strictly medical, are bound to arise in the practice of nearly every doctor.

Especially common is the problem which arises when parents wish to know what should be done with a boy or girl who is masturbating. This may or may not be entirely within the purview of the man of medicine. There may be local irritations to be removed. Circumcism of the boy or girl may be indicated. Perhaps treatment for a nervous disorder is required. But aside from these cases, and even in these when the cause has been removed, there is the question of how to deal with the habit in children who are normal in every respect. They simply have learned to obtain a pleasant stimulus from certain activities and they satisfy a desire for the stimulus at various times. The handling of this class of cases is basically a matter of sex education.

I have been asked to speak especially upon masturbation, but before discussing this subject directly, a few words of a more general nature appear desirable. They will form a framework on which to hang the more immediate issue.

Right at the start it is perhaps best to define the term "sex education," as it will be used this evening. This is very desirable because the term is given about as many meanings as two words can well carry. To some it means issuing precepts to be "good." Others think of it as scaring persons to death with stories of the wreckage from venereal disease. Again, it is thought of as the directing of recreational activities in order to divert the sex impulse into other channels. Many consider it to consist of telling boys about seminal emissions and girls about menstruation. In some minds it is thought of as educating the public to the need for uniform laws relative to marriage, divorce, prostitution and other sex problems. I recently heard a very brilliant member of the medical profession define it as "an attempt to inhibit sexual intercourse through holding community sings." This gentleman is very brilliant in his own field but, like many another genius, he takes the liberty of generalizing without sufficient knowledge upon subjects outside his range of interests.

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* Read before Portland City and County Medical Society, Portland, Ore., May 5, 1926.

Sex education, in my thinking, means the dissemination of such information as will help men and women, both as individuals and as a group, to get the maximum of benefit and the minimum of harm from the existence of sex. It means education which will enable the social group to create such standards, customs and laws as will best provide for a stable, orderly civilization and which will enable the individual to conserve, control and constructively use the enegry which lies at the base of the sex impulse.

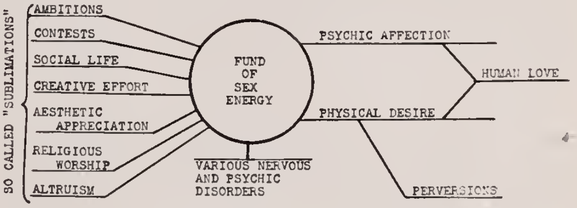
What is needed is neither sensational nor mysterious. It is simply more thorough instruction relative to the biologic, psychologic and sociologic facts, upon which any sound system of sex ethics must be founded. Every person, before reaching adult life, should be at least as familiar with his body, the forces which guide it and the effect of intimate relationships upon it as most of us are with world geography and the relationships of nations. The sooner we get away from the mere giving of precepts about goodness and badness and get down to the giving of accurate knowledge upon which worthwhile decisions as to conduct can be based, the sooner will we approach some solution of our ever troublesome sex-social problems. Men and women do not so much need to be told how to live as they require knowledge of the factors which make for successful living.

Let me now set forth certain premises for your consideration. These are important, for upon their truth or falsity depends the soundness of the conclusions I wish to present. These premises are not manufactured by me. They are what I have found to be the opinions of many eminent physicians who have studied and written upon sex. If the premises are incorrect, then either Ellis, Robie, Kisch, Moll, Malchow, Stanley Hall, Freud and many others of equal standing are mistaken or I have misread their writings.

The premises are:

1. The sex impulse is a fund of energy or one of the possible manifestations of a fund of energy.
2. This energy is a vital factor in the life of every normal man and woman, even though he or she may be kept densely ignorant of its manifestations.
3. An outlet through some channel is certain to be found.
4. There are many possible outlets. These may be roughly visualized through the diagram below.
5. In spite of sublimations there is nearly always a residue of energy which finds its outlet through definite physical desire, either normal or perverted.
6. The outlets for sex energy are largely controlled by thought, the energy tending to follow the paths toward which one's thinking is directed.
7. Sex may be thought of as wholesome and even sacred or as degraded and vulgar, depending upon one's training. No particular attitude of mind can be said to be inborn.

The outlets for sex energy may be accurately, though incompletely, diagrammed as follows:



If we accept the above premises, the sex problem becomes one of inculcating such thoughts and such attitudes of mind as will enable human beings most intelligently to direct a very powerful fund of energy. The intelligent direction of this energy does not mean simply the limitation of physical desire through sublimation. That would leave entirely out of consideration the question of the perversions which result from *misdirected* physical desire. It also would fail to take account of the benefits to be derived from wholesome sex experience. It is my very sincere opinion that no great progress will be made in dealing with sex until we cease to make the limitation of copulation our sole aim. This aim constantly defeats its own purpose as well as preventing any inclusive program. It carries with it the idea of wrongdoing and indecency, thus preventing any sound, balanced view of the subject.

There are three major factors to be considered in any worth-while sex-social program; first, the regulation of physical sex activity; second, the prevention of perversions and other pathologic manifestations; third, the development of individuals through the constructive use of sex.

In my judgment the only weapon with which these three factors can be attacked successfully is education. Men and women must be familiarized with the individual and social forces involved in sex, if they are to make sound decisions regarding their personal activities. Laws will not control sex conduct. Vice crusades can stir up a lot of muddy water and make human beings more hypocritical than ever but they cannot regulate the intimate lives of men and women. Moral precepts can control a small percentage of persons but they are woefully handicapped unless reinforced by accurate knowledge of facts. Clinics and other medical measures can cure venereal disease and ultimately may remove these diseases from the list of human ills, but that will not touch what, to my mind, are the major sex-social problems. Education is the only force that can lift sex out of the mire and make of it a blessing to the human race. It is the only thing that can go inside individuals and direct their intimate lives. A concrete presentation of the truth about sex and the advantages of sane sex living influences the average person more strongly and more permanently than does any other approach to the subject.

Following these observations concerning the sex impulse and the sex-social problem as a whole, we may now give our undivided attention to the specific question of masturbation in normal boys and girls. I have rather hurriedly gathered together four pages of quotations upon the subject but shall not burden you with them, unless it is necessary to show authority for some statement. I do not anticipate any strong reaction here, but this subject is about the hardest thing in the world to discuss rationally before the average audience. There is much prejudice and misconception but very little real understanding regarding the practice and its results.

What are the results of this particular form of sex activity? The most outstanding fact which investigation discloses is that the supposed results have been enormously exaggerated and in many cases have been manufactured out of whole cloth. Treatises on the subject have attributed nearly every known ailment to the practice. One pamphlet which came to my attention, written by a school superintendent somewhere in Connecticut, listed a whole page of diseases, including tuberculosis and locomotor ataxia, as resulting from what the author described as "the heinous crime of self-abuse." Feeble - mindedness and insanity have been ascribed to the practice by many who should have known better. The statement that feeble-mindedness ensued was first made by Tissot in France in the middle of the eighteenth century. He was dealing with mental defectives and his statement should have been that mental deficiency is often accompanied by chronic masturbation. But he inverted cause and effect and the error has been repeated for over a century and a half.

The truth is that far more harm has been done by these misstatements than ever could be directly caused by performance of the act. The anxieties and nervous strains incident to these beliefs have brought much acute suffering to masturbators. Furthermore, the idea that such results ensue has helped to fasten the habit more firmly upon its victims. Worry over the evils to come tends to fix attention on the habit and thus to increase desire. Sexual energy is centered upon that one outlet, and in response the prostate and seminal vesicles are stimulated to greater activity and demand more frequent release.

In order effectively to stop masturbation without concomitant bad effects the attention must be taken off the habit. But before speaking of methods for accomplishing this it will be well briefly to mention just what are the harmful consequences of the practice. The most serious one is the danger of excess. The act, being a solitary one, can very readily be practiced immoderately. The physical effects of such excess are practically, if not exactly, the same as would result from equally excessive copulation, the most serious being, of course, impotence. It is also possible that sex excess in the growing individual removes so much calcium and phosphates from the system that the bony development is retarded, though this has not been definitely proved. Another possible consequence of masturbation is the development of autoerotism and increased likelihood of acquiring perversions. The danger of these difficulties ensuing is, however, greatly reduced, when the act is performed with thoughts of copulation definitely in mind. In addition, the habit often leads to avoidance of social life and makes for a solitary, lonely existence. The one fairly certain result is a lowering of one's attitude toward sex. This, as is even more true in the case of promiscuous relations with prostitutes, spoils some of the fineness that is possible in the marriage relation at its best.

These results are serious enough to prevent any advocacy of masturbation as an accepted method of relieving sexual tension but they are not fearful results and their contemplation does not create such psychoses as is the case with the supposed results discussed earlier.

In considering treatment, a distinction must be made between adolescents and preadolescents. A further distinction must be made between those cases in which there is some pathologic predisposing cause and those in which no such cause exists. The cases where there is a pathologic cause may be eliminated at once, as they are distinctly a medical problem until the cause is removed.

The habit as it is found in young children may be treated very briefly. The first thing to do is to remove any physical causes of irritation, such as too tight clothing, too warm covers, etc. Then keep the child as active as possible and interested in other things. Give it as little opportunity as possible to be alone and send it to bed tired from plenty of active play. Treat the habit incidentally, mentioning that it is foolish and implying that it is not being done by up and coming young folks. Above all, avoid centering too much of the child's attention upon the act through dwelling at length upon the subject or through the use of fear. The average normal child will not follow the practice very long under such treatment and, furthermore, the development of psychoses is not encouraged. This is sound theory, but I must admit that my experience with preadolescent masturbation is quite limited.

I feel that I can speak with more authority concerning the habit in adolescents. Hundreds of cases have been sent or have come to me during the seven years in which I served the state of Oregon as advisor to men. Some were in need of circumcision or other treatment from a physician before a teacher in my position could do anything with them. In most cases, however, they were merely boys who had acquired a habit they found it difficult to break. Nearly all of them wished to stop the practice and had often tried, but they had failed in spite of the fact that they universally believed some very serious consequences would follow. Usually they were sure their will power had been destroyed and their mentalities weakened. Some had been to their ministers and some to their physicians.

The traditional thing for me to do, of course, would have been to try to augment the fears of these youngsters in the hope of building up a fear stimulus strong enough to overcome the desire to masturbate. But right at the start I developed a distinct opposition to this method. In the first place, as pointed out earlier, the best authorities seem to agree that the results of such fears are worse than any direct effects of masturbation and that this sort of treatment more often increases than prevents the practice. Furthermore, it is quite probable that the sex mechanism is damaged more by a sudden stopping of sexual activity than by its moderate continuance. Both Vecki and Robinson point out that when a man becomes a widower and then lives continently for a number of years, upon remarrying he often finds himself impotent. If this is true the same thing should hold for the sudden and complete cessation of masturbation, when it has been carried on regularly through a considerable period of time.

The method of treatment which I have found successful was gradually developed. The aim has always been to give accurate information in a manner that would best enable the masturbator to gain control of the habit. The first objective has been to remove all fears of terrible consequences and to encourage a correct perspective toward the practice. The next step has been to divert the thoughts into other channels through interest in some hobby or activity. I have never tried to persuade a person to stop masturbating suddenly but have encouraged a gradual cessation.

The procedure followed to obtain these results can be quickly summarized. First comes a discussion of the sex impulse in animals and in primitive man as compared with modern man. This is followed by an outline of the uses to which the sex impulse can be adapted. The value of the impulse is considered in relation to the reproduction of the race, in regard to the individual satisfactions, both physical and psychic, to be obtained under various conditions, and as to the benefits derivable from sublimated outlets. With this brackground the truth about the habit of masturbation is presented. The facts, both as to the dangers and as to the lack of dangers from the practice, are clearly set forth.

The young man is then told that if he wishes to stop masturbating and avoid the various possible results he must keep his mind as far as possible from thoughts of the act. He is also told that the way to accomplish this is to find something else which will absorb his thoughts. The ordinary physical precautions, such as plenty of outdoor exercise, cool baths, sleeping on the side and so forth are also suggested. It is frankly explained that, in spite of everything, there will come a time when the desire to masturbate will make it impossible to think of anything else and that the thing to do then is to perform the act and relieve the tension. It is urged that after the act there be no worrying or regrets but that the matter be put entirely out of mind again. The suggestion is then made that the young man come back to the office whenever he feels the need of talking the situation over with someone. Often they return and the matter is again gone over and encouragement is given.

As a rule, progress is reported from the start and, in those cases which I have been able to follow, there has uniformly been a consistent increase in the time elapsing between one masturbatory experience and the next. Normally, after a few months, the habit is dropped. This result is probably due to two causes. As a direct cause the stimulus toward the act is decreased, and as an indirect cause the rationalizing of the procedure makes it seem rather stupid.

This method of handling masturbation in normal adolescent boys is offered for what it is worth. It has enabled many young men to break the habit when other attempts have failed. There may, undoubtedly, have been any number of boys who never came back and who continued to masturbate, but the experience of those who did return assures me that a large percentage gained control of the habit. At least the negative effects of fear were greatly reduced.

The same philosophy that underlies the treatment outlined above applies also to the training of boys and girls so that they may lead adequate and worthwhile sex lives, avoiding the difficulties which make treatment necessary. Young people must know the truth, if they are to make sound judgments. Until the world is able to face sex squarely and truthfully, there will continue to be large numbers of perversions, neuroses, psychoses, impossible marriages and wretched lives resulting from ignorance and misunderstanding of the most vital force in life. When parents and other adults stop developing the curiosity of children toward sex by denying them information, breaking their confidence by lying to them and degrading their minds by emphasizing sex as filth, it may be possible to raise a generation of persons who can face their manhood and womanhood wholesomely and cleanly. Such a generation may at least eliminate much of the suffering that throughout the ages has revolved about the fact of sex.

SURGICAL TREATMENT OF ACUTE SUPPURATIVE PARANASAL SINUSITIS. According to John J. Shea, Memphis, Tenn. (*Journal A. M. A.*, July 17, 1926), the surgical treatment of acute suppurative paranasal sinusitis is emergency surgery. External drainage of severe frontal infection is safer than risking inadequate internal drainage. Rubber tubings as catheters are more efficient than gauze wicks.

CONGENITAL MIXED TUMOR IN KIDNEY REGION*

REPORT OF A CASE

L. HOWARD SMITH, M.D.
PORTLAND, ORE.

From Department of Pediatrics,
University of Oregon Medical School

The kidney is one of the most frequent sites of tumor formation in children. This relative frequency is due chiefly to the congenital mixed tumor of this organ. Most of the malignant tumors of the kidney, excluding the hypernephromas, are reported as sarcoma, carcinoma, sarcocarcinoma, rhabdomyosarcoma, adenosarcoma, teratoid tumor or embryomatous tumor. This indicates its variable structure and also the different opinions which are held as to its nature. Schultz[1] and Young[2] believe it best to call them all mixed tumors.

The interesting feature of the case to be described, wherein it differs from any previously reported case, any that could be found in the literature available, is that the tumor originated and remained wholly outside the kidney itself.

S. G., girl baby, referred by Dr. R. R. Staub. First seen on September 3, 1925, when 17 months old, showing moderate anemia, malnutrition and a mass in the left upper quadrant of the abdomen extending 4 cm. below the costal margin, which was taken to be an enlarged spleen. Blood Wassermann negative.

Hemoglobin 55 per cent. Red blood cell count 4,704,000. Color index 0.6. White blood cell count 15,000. Differential count: Neutrophilic leucocytes 53 per cent, basophilic leucocytes 0 per cent, eosinophilic leucocytes 0 per cent, small lymphocytes 43 per cent, large lymphocytes 3 per cent, transitionals 1 per cent.

Urine normal and remained normal on subsequent examinations. Stool normal.

The previous history is that of an only child, born of young healthy parents. The birth was slightly premature, the baby weighing about six pounds. Breast fed for ten months. At six months she weighed fourteen pounds. The present weight is fifteen pounds, a gain of only one pound in thirteen months. At one year the baby had what was thought to be whooping cough, for which she was given four injections of a pertussis vaccine. Her weight remained stationary and there was loss of appetite. Three or four weeks before the present examination the baby had a gastro-intestinal disturbance and the tumor mass was felt in the lefth hypochondrium (fig. 1).

Progress downward from this point was very rapid until death on October 26, two and one-half months after the onset of severe symptoms with palpable tumor. Cachexia was marked. At no time did the urine show any change from the normal. The extension of the tumor mass from the left costal margin downward, involving the upper half of the abdomen without at any time showing gas in the intestine over the mass, led to the clinical diagnosis of sarcoma of the spleen. One and one-half months after the onset there was bulging of the left eyeball which increased and was later followed by slight bulging on the right eyeball. The baby was blind one month before death. X-ray of the skull showed a growth at the base of the

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* Read before North Pacific Pediatric Society, Seattle, Wash., Feb. 20, 1926.

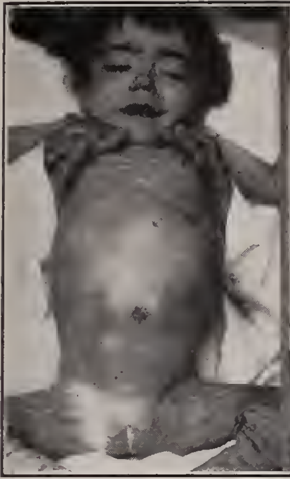

Fig. 1.

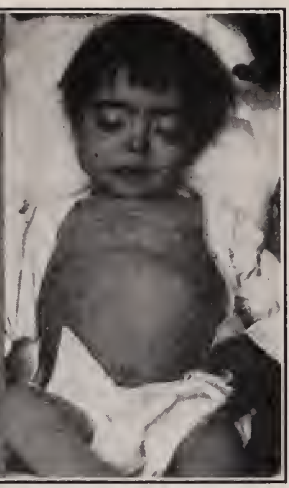

Fig. 2.

Fig. 1. Eighteen months old, 3 weeks before death. Shows emaciation and enlargement of abdomen, due to tumor.
Fig. 2. Shows swelling of right jaw, due to metastasis from sarcoma in retroperitoneal region of abdomen.

brain, that had destroyed the bony structures adjacent to the pituitary body. Metastatic nodules appeared, one large one on the right lower jaw and two smaller ones on the skull. Death occurred from exhaustion and inanition.

Autopsy performed by Dr. Warren G. Hunter with the following anatomic diagnosis: "Small round cell sarcoma, probably primary in retroperitoneal region of abdomen; sarcomatosis (metastases occurring in the periosteum of the skull, cella turcica, sphenoid, ethmoid, left temporal fossa, right lower mandible and plural surface of ribs); distortion of shape of both kidneys and pancreas by pressure of tumor; and marked chronic emaciation and anemia. Microscopic examination of the tumor shows a sarcoma of the small round cell type" (fig. 3).

There is no general agreement as to the exact origin of this kind of tumor. The fact that it occurs so early in the fetal period; as in the reported cases of Walker,[3] and Porter and Carter,[4] definitely places it as a congenital or embryonal tumor. How far back into embryologic development we must go for its origin has caused some discussion, because of the presence of so many different types of tissue present.

According to Schultz,[1] these theories as to the origin of the congenital mixed tumors of the kidney may be grouped under four headings:

1. Busse[5] and Muus[6] held that the tumor is derived from the tissue of the fetal kidney itself, after the kidney has been differentiated off from the rest of the primitive urogenital system.

2. Birch-Hirschfeld[7] held that the tumor takes its origin at a somewhat earlier period of embryonic life, from the anlage of the primitive kidney or Wolffian body, at a stage when the latter has not yet given rise to definite renal tissue.

3. Wilms[8] held that the tumor arises at a still earlier period, before the mesoderm of the middorsal region has given rise to myotome, sclerotome or nephrotome.

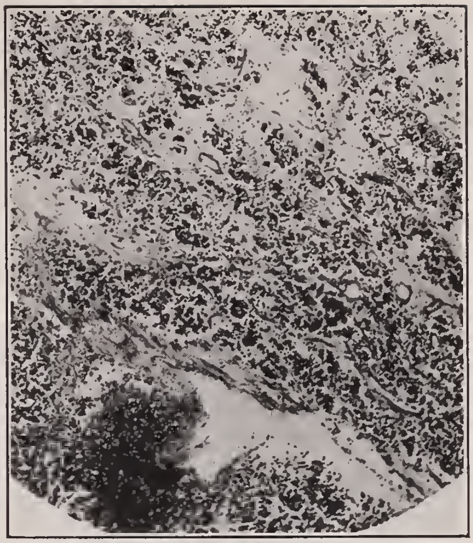

Fig. 3. Microscopic section of tumor. Sarcoma of small round cell type.

4. Ribbert[9] held that the tumor is developed from a totipotent blostome, misplaced at a stage of development before the three primitive germ layers have been formed.

The present reported case, wherein the primary tumor occurred wholly outside the kidney, strengthens the theory that this class of tumor is derived from embryonal tissue before any nephrogenous tissue has been differentiated.

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Teaching of Gastroenterology in Our Medical Schools. In order to determine what position, if any, gastroenterology occupies in the curriculum of undergraduate medical schools, Sidney K. Simon, New Orleans (*Journal A. M. A.*, July 10, 1926), collected information by means of a questionnaire. An analysis of sixty-six replies received shows that sixteen schools have made provision for a special place for gastroenterology in the curriculum. In thirty-five schools special hours are devoted to the subject. In six schools a chair or subchair of gastroenterology has been established. Simon is of the opinion that gastroenterology is now in a position to press its just claim for recognition on the curriculum of the undergraduate school.

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EDITORIAL

ABUSE OF CESAREAN SECTION

Cesarean section is a life-saving procedure for both mother and child in cases where natural birth is impossible from physical malformation or in certain irremediable pathologic conditions. The popularity of the operation, however, within recent years in certain sections would raise the query whether in the hands of some obstetricians it has not become an operation of convenience rather than necessity. During his recent lectures in Spokane, Dr. J. Whitridge Williams, of Johns Hopkins Hospital, was very emphatic in the expression of his views in this regard. The fact that an individual has performed a series of cesarean sections is no indication of superior skill or obstetric knowledge. Anyone possessing two hands, a scalpel, a needle and thread can perform a cesarian section, but the obstetrician, who carries through to successful spontaneous delivery a woman with pelvic deformity or a subject of eclampsia or placenta previa, displays a high degree of professional acumen and is entitled to real commendation. When he encounters a practitioner who proudly announces that he has performed a series of twenty-five cesarean sections, Dr. Williams replies, "You are a darned poor obstetrician."

The statistics from Johns Hopkins Hospital bearing on this procedure are most suggestive of conservatism and illustrate the fact that the necessity for this operation is not as manifest as would be indicated from the records of certain practitioners. In the history of the institution there have been approximately 30,000 deliveries with 365 cesarean sections. Since 1920 there have been 180 of these operations, only one being due to eclampsia and two for placenta previa. In this latter series there was only a single death from infection. Considering the enormous amount of rickets and deformed pelves among a certain portion of Baltimore's population, this record emphasizes the results which can be obtained by patient and conservative attendance upon the forces of nature in the obstetric field. One's inclination toward the spectacular or desire for a short cut during delivery, as exemplified by cesarean section, should be curbed in behalf of the woman's child-bearing future and the preservation of her procreative organs in the state of nature.

THE PHYSICIANS' DIRECTORY

A generation ago it was customary for physicians to carry their professional cards in the daily newspaper. Most members of the profession followed this course and it was not looked upon as objectionable. At the present day a professional card in the lay press stamps one as a practitioner of the twilight zone of medicine and identifies him as an "advertising doctor." At the same time, such a card in a medical journal is an entirely different matter. Within recent years the state association journal has become the accepted medium, in which the specialist can announce his particular line of work to his confreres. In accordance with this policy, a few years ago NORTHWEST MEDICINE established the "Physicians' Directory" for the publication of professional announcements. The query has been offered by some as to whether this is an ethical and acceptable form of advertising. At the recent annual meeting of the trustees and editorial staff of this journal, at the time of the medical meetings in Spokane, the Physicians' Directory was discussed. The approval of all present was registered as an endorsement for the continuation of this form of individual professional advertisement. It was directed, however, that if the editor were not personally posted on the accuracy of an individual's claims for proficiency in his specialty, the matter of accepting such a professional card should be subject to the approval of the journal trustees or editorial representatives from his state, whose opinion should be conclusive.

THE SPOKANE MEETINGS

A new experiment in medical meetings was presented at Spokane last month, when the Washington State Association and the Pacific Northwest Association held meetings in conjunction with each other. The prospect was viewed with some trepidation on the part of the state officials, lest the larger meeting should overpower the state meeting to such an extent as to make it of little moment. Such fears, however, were not realized. The attendance at the state meeting was of a gratifying character, enlarged, perhaps, by the attendance of some who were attracted by the splendid program of the Northwest association which followed it.

The golf tournament, which preceded the state meeting, also attracted a large contingent of devotees to that game. The result was a satisfactory registration and a good attendance to the session. The papers were entirely by the members, except those by Drs. Lilienthal, of New York, and Lisser, of San Francisco, both of whom appeared on the program of the succeeding meeting. The papers presented were on live topics which held the interest of those in attendance. The officers of the society are to be congratulated on the successful outcome of the meeting, considering the handicaps under which it labored.

The program of Pacific Northwest Association was of the splendid character with which these meetings have become thoroughly identified. No gathering of the medical profession of the Northwest presents such a splendid opportunity for meeting and listening to the leading men of this country. The sixteen speakers on the program represent the best development of medical thought and practice, as exemplified in all parts of the land. Every man is a specialist in some branch of the medical art. It is a wonderful privilege to be associated for three days with such a group of outstanding medical men. Physicians of this section of the country who fail to take advantage of these meetings do not realize what they are missing.

As the years go by new men of brilliant attainments in the various branches of medicine are replacing the veterans who have led medical thought in the past. This program presented a well balanced selection from the older and younger leaders of the profession. Dr. Dock, well known and beloved by Michigan graduates for many years, is always received by an attentive and appreciative audience. His wide practical experience and years of teaching give an authoritative character to his utterances. Dr. Williams, of Johns Hopkins Hospital, is known to every obstetrician of the land through his books and writings on obstetrics which have become standards of authority. It was a pleasure to meet him in person. His addresses were among the most charming and attractive of the program. Dr. Lilienthal, of New York, is known to everyone who ventures into lung surgery. His publications are authoritative in this special line. The enthusiasm which he exhibited in the presentation of his subject and the clearness with which he illustrated his views attracted a full house to all of his addresses. Dr. Ivy, of Northwestern Medical School, is a representative of the younger leaders in the profession. He presented a series of fascinating addresses on the physiology of various abdominal organs, presenting new thoughts and the results of the latest investigations along these lines of study. Drs. Adson, of the Mayo Clinic and Collip, of Alberta, are known to the profession of the Northwest from previous visits. They were as welcome as in the past, both from their personalities and the subject matter which they presented. Dr. Adson is an outstanding figure in neurologic surgery and the work which Dr. Collip has accomplished in the investigation of insulin and parathyroids place him among the leaders of the profession. The other men on the program can be cited as outstanding leaders in the special branches of medicine with which their names are connected. It would be a pleasure and satisfaction to mention each in turn. It was a rare educational opportunity to listen to all of these splendid addresses. During the coming months it is expected that a large portion of the papers presented at this meeting will be published in NORTHWEST MEDICINE. An effort is being made to assemble all of them which will be available to utilize for this purpose.

MONTANA MEETING AT BILLINGS

The meeting of the Montana Association at Billings last month was notable because of the large percentage of its membership in attendance. The registration was about one hundred twenty-five, approximately 50 per cent of the membership of the association, which is a very unusual proportion for the attendance at any state meeting. It was generally proclaimed as one of the largest and best gatherings in the history of the organization. Another interesting feature was the fact that nearly all of the papers were offered by the members, representative of all parts of the state. They were on live topics and possessed a high degree of merit. The Montana profession is to be congratulated on the quality of its membership and the advanced outlook which they possess toward the practice of medicine.

Several men of distinction were present from eastern states. Dr. Will Mayo was a welcome guest and presented in an attractive manner the latest views on the prospects concerning the conquest of cancer and its possible eradication. He indicated that probably we have a long way to go before that much desired object is obtained. He paid a truly deserved and high tribute to Dr. Coffey of Portland for the outstanding original work which he has accomplished in intestinal surgery, emphasizing the commanding position which he occupies among the surgeons of the Northwest. These pleasing amenities preceded Dr. Coffey's address on the treatment of gastroduodenal ulcers, illustrated from a very wide and successful experience. Dr. Morris Fishbein, editor of the *Journal of the American Medical Association,* is making the acquaintance of the profession of the country by visiting series of state association meetings. His presence on such occasions is welcome, his eloquent address with choicest diction being a most attractive feature of a program. His review of twenty-five years of medical progress furnished a striking evidence of the great benefit in the progress of mankind, which has resulted from the discoveries and investigations of medical men. These facts should be presented to every skeptic and scoffer against modern medicine.

Billings is an enterprising and up-to-date city. Its medical profession gave a warm and pleasing reception to the physicians of the state and other visitors. Although the thermometer registered a notable elevation of temperature, which seemed oppressive to those accustomed to a cooler climate, it was accepted as a matter of course and did not interfere with the medical program or other features of the meeting. It was particularly noticeable that the golf enthusiasts were able to gratify their urge for the game, and took advantage to the fullest extent of the golf hospitality of the profession of the city.

Mention should be made of the meeting of health officers preceding the medical meeting. Officers of the State Department of Health, together with U. S. health officials, have accomplished notable and outstanding results in matters of public health, particularly valuable being investigations regarding tick-fever and tularemia, their work along these lines having national significance. Their meeting brought together prominent representatives of public health work from various parts of the country. Meetings of the Montana medical profession are worthwhile gatherings and are of real value to medical progress.

IDAHO STATE MEETING

The Idaho State Medical Association will hold its annual meeting at Sandpoint September 2-4. Several years have elapsed since the association has met in this city, being in the northern section of the state. It is especially accessible to eastern Washington. Consequently the profession from this section is cordially invited to attend. The program, as appears below, presents an attractive group of papers which should serve to bring a large representation to the meeting from all parts of the state.

Program

Wednesday, 8 p. m., Sept. 1.

Open Meeting High School Auditorium

"Team Work by the Doctor and the Layman for Health Betterment." Dr. John M. Dodson, of the Bureau of Health and Public Instruction of the American Medical Association.

First Session of the House of Delegates

Thursday, 8 a. m., Sept. 2.

Registration—Hotel Ponderay

Meeting Called to Order—Dr. N. R. Wallentine, President, Sandpoint, Ida.

Address of Welcome—Mayor E. W. Wheelan, Sandpoint

"Fractures from a Practical Standpoint." Dr. Mitchell Langworthy, Spokane, Wash.

"Cardiac Pain." Dr. C. F. Strong, Vancouver, B. C.

"Pediatrics in General Practice." Dr. F. B. Evans, Dover, Ida.

"Organized Medicine." Dr. John M. Dodson, A. M. A., Chicago, Ill.

The above program will be distributed as seen fit by the chairman, before and after a short recess for lunch.

8 p. m.

Boat, Lake, Dinner, Social Evening

Friday, 9 a. m., Sept. 3.

"Goiter," Illustrated. Dr. J. C. Moore, Seattle, Wash.

"Surgery vs. X-Ray Treatment of Goiter." Dr. G. H. Wahle, Boise, Ida.

"The Treatment of Pulmonary Abscesses." Dr. Emile Holman, San Francisco, Cal., Professor of Surgery, Stanford University.

"The Surgical Correction of Facial Defects." Dr. Thomas F. Mullen, Pocatello, Ida.

1 p. m.

House of Delegates—Second Meeting

"Principles of Surgery of the Large Intestines Including the Upper Rectum." Dr. Robert C. Coffey, Portland, Ore.

"Bartholin's Glands, Skene's Glands and the Cervix as Focal Infections Which Cause Rheumatism." Dr. Alfred Baker Spalding, San Francisco. Professor of Obstetrics and Gynecology, Stanford University School of Medicine.

"Rheumatic Heart Disease." Dr. G. F. Strong, Vancouver, B. C.

7:30 p. m.

Banquet—Hotel Ponderay

Public Health League—P. H. L. Program

Saturday, 8 a. m., Sept. 4.

House of Delegates—Third Meeting

"The Physician and His Patient." Dr. John T. Wood, Coeur d'Alene, Ida.

"Limitations of Cesarean Section." Dr. Alfred B. Spalding, San Francisco, Cal.

"Results of Pollen Extract Treatment of Hayfever in the Northwest." Dr. Robert F. E. Stier, Spokane, Wash.

1.30 p. m.

Business Meeting and Report of A. M. A. Delegate, Dr. Geo. R. Proctor, Nampa, Ida.

"The Colon—The Most Abused Organ of the Body." Dr. I. H. Moore, Seattle, Wash.

"Some Observations on the Ligation of Large Arteries." Dr. Emile Holman, San Francisco, Cal.

Closing Business and the Installation of Officers.

PUBLIC HEALTH LEAGUE OF IDAHO

Paul Davis, Executive Secretary
Boise, Ida.
Program
Friday, 8:30 p. m., Sept. 3.
Following the Banquet.

"The Washington League." Dr. Frederick Epplen, Spokane, Wash.

"The Idaho League." Dr. James L. Stewart, Boise, Ida.

"Public Health Leagues." Dr. H. P. Marshall, Spokane, Wash.

MEDICAL NOTES

Summer School of Vancouver Medical Association. The following is a list of the speakers and their subjects in connection with the sixth annual summer school of the Vancouver Medical Association at Vancouver, B. C., September 13-16. (See advertisement page 8.)

Sir Henry Gauvain, M. D., M. C. (Camb.), English Orthopedic Surgeon. Two subjects to be announced later.

Dr. A. S. Warthin, Professor of Pathology, University of Michigan. (1) Syphilis of the Heart of the Aorta. (2) The Nature of the Inherited Susceptibility to Cancer. (3) Some Unusual Forms of Diseases of Children. (4) The Causes of Renal Insufficiency.

Dr. C. A. Hedbloom, Professor of Surgery, University of Illinois. (1) Differential Diagnosis and Treatment of Chronic Pulmonary Suppurations. (2) Phrenicotomy and Extrapleural Thoracoplasty in the Treatment of Pulmonary Tuberculosis. (3) A Study of the End Results following Radical Amputation of the Breast for Carcinoma. (4) The Differential Diagnosis and Treatment of Acute Abdominal Conditions.

Dr. George Gellhorn, Professor of Obstetrics and Gynecology, St. Louis University. (1) Milk Injections for Pelvic Infections in Women. (2) Syphilis in Gynecology and Obstetrics. (3) The Treatment of Postpartum Hemorrhage. (4) Causes and Treatment of Vaginal Discharge.

Dr. R. R. MacGregor, Professor of Pediatrics, Queen's University. (1) The Common Nutritional Disturbances of Infancy Observed in Practice. (2) Chronic Intestinal Indigestion. (3) Pyelitis of Infancy. (4) Intestinal Intoxication.

Dr. George Hale, Professor of Medicine, Western University. (1) Nephritis from the standpoint of the General Practitioner. (2) Functional vs. Organic Cardiac Disease. (3) "The Patient Complains of Dyspepsia." (4) A Confusing Syndrome.

Dr. Fraser Gurd, Associate in Surgery, McGill University. (1) Treatment of Fractures Involving Ankle Joint. (2) Empyema—Actue and Chronic. (3) The Treatment of Acute Perforated Appendicitis. (4) The Treatment of Compound Fractures.

Interstate Postgraduate Assembly of North America will meet at Cleveland, Ohio, Oct. 15-22. A very elaborate program has been prepared, including leading members of the medical profession from the nations of North and South America, Great Britain and most of Europe. Papers listed cover all branches of medicine and surgery. Three sessions are scheduled for each day and every one is packed full of the best possible material. It would be impossible for one mind to absorb and digest all of this program but everyone can find in it the latest and best information in his line of work.

Pacific Northwest Medical Association, at its recent annual meeting in Spokane, elected the following officers for the ensuing year: President, Dr. E. T. Root, Salt Lake City; first vice-president, Dr. E. A. Sommers, Portland; second vice-president, Dr. C. A. Brown, Vancouver, B. C.; secretary-treasurer, Dr. Frederick Epplen, Spokane. The 1927 meeting will be held in Boise, Idaho.

Northwest Medicine Meeting. In conjunction with the recent Spokane medical meeting was held the annual meeting of the trustees and editorial staff of Northwest Medicine. The following officers were elected for the ensuing year: President Board of Trustees, E. W. Janes, Tacoma; vice-president, C. J. Smith, Portland; secretary and editor-in-chief, C. A. Smith, Seattle; business editor, J. B. Eagleson, Seattle.

OREGON

Eastern Oregon District Medical Society held its annual meeting August 4, at Hot Lake. A feature of the day was an excursion to North Powder Lakes.

Hospital Addition. A new $30,000 wing to the Salem hospital is now in process of construction. This will increase the total bed capacity to seventy-five.

Bequest to Hospital. The late Chester D. Edwards, of Eugene, has left $5,000 in bonds to the State Tuberculosis Hospital at Salem.

Osteopaths Object. Dr. John L. Lynch, representing the osteopaths of Salem, has gone before the board of trustees of the Salem hospital, charging that discrimination has been shown by the hospital in reference to allowing osteopaths to admit cases. He claims that the hospital was built by a community subscription, and should be open to all licensed practitioners.

Physician Risks Life. Dr. W. D. Huntington, of Portland, recently rescued a woman from drowning in the Columbia river. In the effort the doctor himself was overcome and was saved by a woman spectator.

Doctor Undergoes Operation. Dr. H. M. Shaw, of North Bend, was operated upon in Portland recently for a serious infection of the thyroid gland.

WASHINGTON

Postgraduate Lectures. The tenth annual postgraduate medical course of the University of Washington, was held July 19-23. Dr. George Dock of Pasadena, California, delivered the lectures on medicine. Dr. Fred W. Rankin and William F. Braash those on surgery and urology respectively. One hundred and seventy-five physicians attended the course.

Tourist Camp Menace. At the annual meeting of the county health officers of Washington, at Spokane, the serious problem of stream pollution, due to increased tourist travel, was discussed. The concerted opinion of the health officers seemed to be that it will soon become necessary to establish fixed camps with central conveniences and prohibit camping outside of these.

Elks Provide Clinic. Through the aid of the Everett lodge of Elks, children of poorer parents of Snohomish county are to be provided with free care for medical ailments at a clinic in the Medical and Dental Building. Physicians and dentists of Everett have agreed to contribute their services to this work.

Rules Against Hospitals. Assistant Attorney General N. G. Wight, has rendered the decision that Washington Association of Hospitals cannot establish its own fee schedule for doctors working on cases falling under the workman's compensation act. It had been proposed by the hospitals that they receive a slightly higher schedule than was paid to the physicians, the difference in which they claim would would be equalized by the ambulance service provided.

Centralia Hospital Completed. The new Centralia General Hospital was opened to patients July 3. The building is three stories in height and is finished in cement stucco. It contains 40 rooms and small wards. Miss Winifred Golley, formerly of the Seattle Swedish Hospital, is superintendent.

New Site Secured. The Seattle Swedish Hospital Association has purchased the northwest corner of Marion Street and Minor Avenue. A 100 bed addition to the hospital is contemplated, to be built in the near future.

Decision Favors Osteopaths. In the U. S. District Court last month Judge Jeremiah Neterer rendered a decision that osteopaths are not estopped by the Beeler act from the use of narcotics, thus annulling the action of federal narcotic chief, Harry V. Williamson who, acting on the opinion of the attorney general, had recalled the narcotic permits of 150 osteopaths. This decision will be appealed to the U. S. Supreme Court for final action.

Sanipractic Failure. For two months sanipractic leaders, under the guidance of John E. Lydon, of the malodorous diploma mill, have attempted to secure 40,000 signatures through the length and breadth of the state in order to present an initiative petition before the people at the fall election which would sustain their cult and reinstate the debarred possessors of diplomas from Lydon's abolished institution. In spite of unceasing efforts only about half the needed signatures could be secured when the time limit expired. The Public Health League had an active part in suppressing this effort.

Newly Elected Officers. Dr. A. O. Loe, of Seattle, is president, and Dr. H. E. Coe is secretary-treasurer of the Public Health League of Washington for the years 1926-27.

New Health Officer. Dr. K. W. Berry, of Montesano, has been appointed health officer of Grays Harbor county. He succeeds Dr. J. H. Fitz, who has recently gone to California.

Lincoln County Medical Society, at its annual meeting at Harrington, elected Dr. F. W. Milburn, of Reardan, president, and Dr. C. S. Bumgarner, of Davenport, secretary.

Clallam County Hospital Petitioned. The county commissioners of Clallam county, in response to a recent petition, will in November place before the voters the question of a bond issue for a City-County hospital. The project is backed by the Chamber of Commerce of Port Angeles, in which city it is proposed to locate the hospital.

Dr. J. P. Kane, of Walla Walla, has moved to Tacoma, where he will engage in practice. He returns to the site of former activities, having practiced in Tacoma for many years.

Dr. G. G. Espe has sold his hospital in Ione to Drs. D. H. Lewis and C. N. Canning, of Spokane, and will go East for postgraduate work.

Dr. H. D. Lilibridge, of Chicago, has taken over the practice of Dr. G. T. Pool at Yelm.

Dr. L. G. Steck, recently of the Seattle City hospital, has located in Ryderwood.

Medical Weddings. Dr. Faris M. Blair, of Seattle, was married to Miss Irma Stark, of Helena, in that city on July 3. Dr. J. A. Benschoff and Miss Leonella Padden, of Seattle, were married on June 28. Dr. John W. Rose, of Marysville, was married to Miss Therza Corlett, of Seattle, July 1.

IDAHO

New Veterans' Bureau Chief. Dr. B. W. Black has been appointed medical director of the U. S. Veterans' Bureau in place of Dr. E. O. Crossman, the latter having been placed in charge of the Veterans' hospital at West Roxbury, Mass.

Dr. O. J. Moorhead, formerly city and county health officer at Walla Walla, Wash., has located for practice in Kendrick.

Dr. W. A. West has opened an office in Rigby.

Dr. Kenneth G. Whyte, who has practiced for several years at Boise, moved recently to Seattle.

Medical Weddings. Dr. John M. Waste and Miss Elizabeth Horsley, of McCammon, were married June 30, at Price, Utah. Dr. Lawrence Quilliam, U. S. Veterans' Bureau physician, of Boise, was married June 9 to Mrs. Frances Currin McNelley, of Seattle.

MONTANA

Heads Railway Surgeons. Dr. A. F. Longeway, of Great Falls, was elected president of the Great Northern Railway Association of Surgeons at its recent annual meeting in Winnipeg. Great Falls was selected as the meeting place in 1927.

Hospital Addition. Work has been begun on a three story addition to St. Joseph's hospital at Lewistown, which is to house the maternity service.

Join Resident Staffs. Drs. J. Doyle and Neil O'Keefe, recently graduated from Creighton medical school, have begun internships at St. James hospital, Anaconda.

Drs. Chester Dixon and E. C. Person, of the University of Nebraska, are new interns at Murray hospital in the same city.

Dr. F. N. Isom, of Livingston, having completed thirty-nine years of active practice, has retired.

OBITUARIES

Dr. F. A. Christensen, of Seattle, Wash., died July 3, aged 59 years. He was born in St. Louis and was graduated from the Central College of Physicians and Surgeons at Indianapolis in 1895. He had practiced in the Ballard district for twenty years. He was prominent in civic affairs of that district.

Dr. W. V. Kingsbury, pioneer physician and surgeon of Montana, died in Butte June 14, following a stroke of apoplexy. He was born in 1864 in Hillboro, Ill. He graduated from the College of Physicians and Surgeons in St. Louis, and practiced for seven years in Dillon, Mont., before settling in Butte. In his early years he was a member of the geological survey party which determined the eastern boundary of Alaska in the early 90's.

Dr. I. P. Gunby died suddenly, June 26, at his home in Seattle from heart disease. He was born in Louisiana in 1863 and graduated from Tulane University medical school in 1884. After graduation he practiced continually in Sherman, Texas, until 1925, when with his son, Dr. Paul Gunby, he moved to Seattle.

Dr. James L. Atkinson, of Fairview, Mont., died at his home June 3, aged 70 years. He was born in Mount Vernon, Ill., and practiced there for several years before going to Montana. He was government physician at Poplar from 1887 to 1918, when he resigned from the service.

Dr. William T. Seeley, of Kendrick, Ida., was killed July 3, being struck by a passing automobile while he was repairing his own car on the highway. He was born in 1873 and graduated from the University of Illinois College of Medicine in 1910.

MEDICAL RESERVE CORPS

STATUS OF MEDICAL RESERVE CORPS

Herewith is a statement as to the status of Medical Reserve Corps acairs in the Ninth Corps Area. The state of Montana has within the past month more than completed its quota. Oregon is approaching its quota and only needs 2 more enrollments in order to respond 100 per cent. Washington and Idaho are still lagging behind the other states of the Northwest, and the personnel of various medical units allocated to the Northwest still remains incomplete.

Distribution of Medical Reserve Corps Officers by States, Ninth Corps Area, on June 30, 1926

State	Number of physicians registered	Number of Medical Reserve Officers each State should furnish	Per centage of total required	Number of Medical Officers enrolled	Per centage enrolled of total required
California	7549	1243	60.7	724	58.24
Washington	1756	289	14.1	187	64.70
Oregon	1158	191	9.3	164	85.81
Montana	568	94	4.6	99	105.31
Utah	497	82	4.0	100	121.94
Idaho	452	75	3.6	45	60.00
Wyoming	263	43	2.1	36	83.72
Nevada	140	23	1.1	10	43.3
Alaska	60	10	0.5	2	20.0
TOTAL	12,443	2050	100	1367	66.68

The following changes of assignment status of members of the Reserve Corp are announced:

1st Lieut. John F. Fiorino, Med- Res., 1323 So. "J" St., Tacoma, Wash., assigned to General Hospital No. 141, Zone of the Interior, as Medical Ward Officer.

Capt. Earl L. Reger, Med-Res., University Club, Spokane, Wash., relieved from assignment to 85th Evacuation Hospital, 3rd Army.

1st Lieut. Claude H. Dulaney, Med-Res., Augusta, Montana, assigned to Veterinary General Hospital No. 60, Zone of the Interior, as Medical Attendant.

1st Lieut. Claude E. Wiseman, Med-Res., Eatonville, Wash., assigned to General Hospital No. 141, Zone of the Interior, as Evacuation and Receiving Officer.

Capt. Edward M. Gans, Med-Res., Meagher St., Judith Gap, Montana, assigned to General Hospital No. 145, Zone of the Interior, as Surgical Ward Officer.

Capt. Carl E. Koenig, Med-Res., 3203 East Madison St., Seattle, Wash., assigned to General Hospital No. 50, Communications Zone, as Evacuation and Receiving Officer.

1st Lieut. Frank A. Decker, Med-Res., P. O. Box 664, Rearden, Wash., assigned to General Hospital No. 143, Zone of the Interior, as Medical Ward Officer.

Lieut. Col. Joseph H. Sayer, Med-Res., 6307 15th Ave. N.E., Seattle, Wash., relieved from assignment to Station Hospital No. 143, Communications Zone.

By direction of the President, and under authority contained in letter from the Adjutant General, dated October 7, 1925, Subject: Training Year, 1926, and General Orders No. 35, War Department, November 28, 1924, and pursuant to letter 121.2-1 (9th CA) AA The Surgeon General's Office, dated uly 2, 1926, the following named reserve officers of the Medical Department Reserve, are ordered to active duty for training ecective September 12, 1926. On that date each reserve officer named herein will proceed without delay to Fort McDowell, California, and upon arrival thereat will report in person to the Commanding Officer thereof for training.

Each officer will rank from the date specified after his name.

Colonel James Beaty Eagleson, 0-164511, 902 Boren Ave., Seattle, Washington, Sept. 12, 1926.

Colonel Edward Antone Rich, 0-149965, 1217 Rust Bldg., Tacoma, Washington, Sept. 12, 1926.

PUBLIC HEALTH LEAGUES

OREGON

The League has begun the publication of a biweekly bulletin called "Oregon's Health." It is designed to cover the nonscientific interests of the medical profession of the state and it will also be utilized to effect a more close cooperation among its various health agencies. The first number of the bulletin appeared on July 14.

Considerable time is being devoted to a study of the medical practice acts of the various states. Particular attention is being paid to the various methods used to define the practice of medicine, the method of organizing the examining body, and the different methods of enforcing medical laws. The recently enacted medical practice act in New York is also being closely studied.

President W. B. Morse and Secretary F. D. Stricker of the State Medical Society, and the Executive Secretary of the League, recently made a trip into the southern part of the state. Stops were made at Marshfield, North Bend, Coquille and Roseburg, where the physicians were urged to get behind their state organizations. Dr. Morse spoke on the aims and purposes of the state society, Dr. Stricker talked on the work which the society is doing in promoting periodic health examinations and Mr. Foley spoke on the need for the organization of the medical profession for nonscientific purposes. The groups visited responded enthusiastically and at Roseburg the physicians of Douglas county organized a new local society.

WASHINGTON

SPOKANE MEETING

Dr. Frederick Epplen of Spokane, retiring president of the Public Health League, featured his talk before the Spokane convention by urging the League to take a new creative role in the fight against disease by establishing a heart clinic in one of the larger cities of the state. The necessity of more public information on the heart was apparent, he said. Such a campaign, properly supported by the right kind of publicity, would reach a large part of the population not now being helped directly by League activities.

The Spokane meeting of the League, held on June 29, was the largest attended of any League session. The reports presented indicated that the organization had a very prosperous year financially and that impressive results have been obtained.

SANIPRACTORS IN CLASH

Rival sanipractic groups carried their troubles into the courts at Olympia July 16, when one of the factions, led by John E. Lydon, asked the court to grant an order enjoining the department of licenses from accepting the credentials of 26 applicants recently graduating from the "Universal College of Sanipractic." Lydon claimed that the applicants had not been qualified according to law and should not be granted licenses. It was further alleged that the giving of drugs was taught in this drugless school, though sanipractic is a drugless method of practice. The court ruled in favor of the department and the 26 were admitted to the examination, the result being that Washington has 26 more "doctors" in its midst.

INITIATIVE PETITION FAILS

The effort to obtain 40,000 signatures to a petition for a referendum on sanipractic signally failed. No names were submitted to the secretary of state, though it is stated that some 23,000 voters of Washington signed the petition. Approximately 5 per cent of the voters were willing to support the sanipractic plea for a popular vote on this method of healing. Less than 5 per cent of the newspapers of Washington gave space to this attempt to manufacture medical practitioners via the ballot box. Carrying a referendum on health legislation in 1922 by a majority in the state of 60,000, and defeating an attempt to obtain a referendum to break down healing standards by developing overwhelming public opposition is the record established by the League in its health activities.

REPORTS OF SOCIETY MEETINGS

WASHINGTON STATE MEDICAL ASSOCIATION

MINUTES OF THE THIRTY-SEVENTH ANNUAL MEETING OF WASHINGTON STATE MEDICAL ASSOCIATION, HELD AT DAVENPORT HOTEL, SPOKANE, WASH., JUNE 29-30, 1926

The thirty-seventh annual meeting of Washington State Medical Association was convened at the Davenport Hotel, Spokane, Washington, June 29, 1926.

HOUSE OF DELEGATES

FIRST SESSION

The Board of Trustees with the House of Delegates was called to order by the president at 9:30 a. m. on June 29. On calling the roll a quorum was found present, the following delegates answering to their names: S. S. Oppenheimer, H. G. Willard, H. E. Cleveland, C. H. Thomson, J. H. O'Shea, A. O. Loe, D. H. Houston, C. R. McCreery, E. E. Hill, J. B. Munly, C. L. Smith, M. Langworthy, E. W. Janes, F. Epplen, P. D. McCornack, D. H. Palmer, R. S. Mitchell, L. S. Roach, G. C. Miller, R. J. McCurdy, G. A. Dowling, J. E. Hunter, B. T. King, J. T. Mason, A. C. Crookall, R. S. Anderson, F. W. Anderson, L. F. Wagner, J. R. Brown, W. B. Penney, W. L. Jackson, E. M. Adams, Chas. Butts, W. E. Rhodehammel, J. C. Lyman, J. R. Morrison, C. J. Lynch.

It was moved that the minutes of the last annual session be adopted as published. Seconded and carried.

The secretary stated that it was customary to have the books examined by a certified public accountant on January 1 and July 1 of each year, and that there had been one audit since the last annual meeting; an abstract of which was printed in the program and which would also be published in Northwest Medicine.

FINANCIAL REPORT FOR 1925

To the Officers and Members,
The Washington State Medical Association
Seattle, Washington.

Gentlemen:

We have audited the books and records of your Association for the calendar year ending December 31, 1925, and as a result thereof have prepared and present herewith our report, and as a part of this report we attach the following exhibits:

Medical association fund	Exhibit "A" Page 4
Legal defense fund	Exhibit "B" Page 5
Disbursements M. A. F.	Exhibit "C" Page 6
Disbursements L. D. F.	Exhibit "D" Pages 7 and 8
General Receipts	Exhibit "E" Page 9
Recapitulation	Exhibit "F" Page 10

These exhibits, we believe, are to a large degree self-explanatory. However, we might touch briefly upon each, and shall do this in the order in which they appear above.

MEDICAL ASSOCIATION FUND

Receipts from membership dues, as shown by Exhibit "A", amounting to $5,060.00, have been compared with remittance reports from the various County Society Secretary-Treasurers and found to be correct. There have been 1,035 paid memberships. Of these 4 were for 1923, 97 for 1924, 932 for 1925, and 2 for 1926, thus showing a paid membership for 1925 of 932. You will note a credit to this fund of $7,588.61, a decrease for the period of $251.52.

LEGAL DEFENSE FUND

Receipts from subscriptions to this fund, amounting to $3,700.00, as shown by Exhibit "B," have been compared with the number of certificates issued and those shown by the cash book, and found to be in agreement. This fund now shows a credit balance of $7,322.44, an increase of $1,372.48 for the period.

DISBURSEMENTS

All disbursements, as shown by Exhibits "C" and "D", have been made by voucher check, drawn on the regular depository (Seattle National Bank), and are properly endorsed and cleared through the bank in regular order. These checks are all covered by properly O. K.'d invoices from the parties to whom payment is made or payment authorized by the By-Laws of the Association.

INTEREST RECEIVED

Interest received from Liberty Bonds, $446.25, and savings account $50.00, as shown by Exhibit "E", has been divided equally between the two funds.

RECAPITULATION

There has been a total of receipts from all sources of $9,256.25, for the year under review, and disbursements of $8,135.29, leaving an increase of receipts over disbursements of $1,120.96. This amount added to your January 1st balance of $13,790.09 gives you a total in the hands of your Treasurer of $14,911.05 at December 31, 1925, as shown by Exhibit "F."

Cash on hand, $20.00, was verified by actual count. Balance on open account at Seattle National Bank, $1,545.25, was compared with statement from the depositary and found to be correct. Washington Mutual Savings Bank, $3,050.00, was verified with the depository. Liberty Bonds, $10,295.80, were presented for examination at 11:00 a. m., December 30, 1925, and original bonds purchased were found to be intact, all due coupons being clipped and deposited to the credit of your account. All coupons not due were attached to the bonds.

Respectfully submitted,
Louis E. Smith & Co.
Certified Public Accountants.
(Signed) By Louis E. Smith.

On motion the audit was accepted as published.

It was moved that the reports of the committees as published in the Program be accepted. Seconded and adopted.

INDUSTRIAL RELATIONS

Dr. J. H. O'Shea, Chairman

The State Industrial Relations Committee held two meetings, the first in Seattle, in February, 1926. Dr. Walter Kelton has resigned as Chief Medical Director of the Department of Labor and Industries, and Dr. L. L. Goodnow was appointed his successor. Owing to the change in administration of the office, it was deemed inadvisable to transact anything except of a routine nature at the meeting.

The second meeting was held in Seattle in April. 1926. Mr. James Shaughnessy, Supervisor of the State Medical Aid Department, and Dr. L. L. Goodnow, Chief Medical Advisor of the Department of Labor and Industries, met in conference with the Committee. A detailed discussion of some of the problems of the Department with reference to the profession throughout the state was carried on, and Dr. Goodnow and Mr. Shaughnessy assured the Committee of their desire to cooperate to the fullest extent.

It was decided that the Department of Labor and Industries in conjunction with the State Industrial Relations Committee would issue a standardized treatment of all simple fractures. These bulletins will be compiled by different men throughout the state and then issued by the Department of Labor and Industries.

It is hoped that the treatment of fractures will become more nearly standardized throughout the state.

CHILD WELFARE

Dr. P. D. McCornack, Chairman

It is not the purpose of this committee to carry on or institute any kind of infant welfare work. Its purpose is to keep in touch with the various activities of the different organizations doing infant welfare work over the state and to report their findings to this body. We offer assistance, through the medical profession of the state, to all legitimate organizations doing this kind of work. It is our purpose also to help coordinate the activities of various organizations in the state that there will be no duplication of program. The most efficient agency for infant welfare work of the state is that conducted by the Child Hygiene Division of the State Department of Health. This Department works in coordination with every other infant welfare agency of the state, in so far as possible, and is in very close touch with the medical and nursing profession at all times. The report of this committee is really a record of the activities of the Child Hygiene Division of the State Department of Health for the past year.

The health officer of every county in this state has been made a chairman of a County Infant Welfare Committee, composed of himself, the county nurse and two or three lay persons in the county. This has coordinated the work immensely in most counties and has stimulated extraordinary activities in some counties. In September, 1925, some members of your committee appeared before the annual county health officers' meeting and discussed the maternity and infancy welfare work being done throughout the state. Much enthusiasm and interest was exhibited and a number of new counties immediately made request for infant welfare conferences.

During the year a large number of members of the State Medical Association have delivered lectures throughout the state on infant welfare and prenatal care and various other subjects relative to infant welfare work.

In January, this year, your chairman was appointed by the Director of Health, Dr. Stuht, to represent his department at a meeting held in Washington, D. C., of the heads of the Child Hygiene Divisions of each state health office. This was a very enthusiastic meeting and much good has resulted from such contact.

Under the direction of the Department, child health conferences have been held in many counties of the state. Some of these counties have taken up the work for the first time and others continuing the enthusiasm of former years. During these conferences—

1. Many children are thoroughly examined;
2. Health schools are conducted by physicians with the aid of local nurses;
3. Literature is distributed;
4. Charts are shown;
5. Demonstrations on various phases of child care are given.

The correspondence course in the hygiene of maternity and infancy conducted by the State Department in conjunction with the Washington State University has been received with unusual interest by the women of the state and is doing much good. Physicians could profitably encourage private prenatal cases to utilize this course.

During the year several extraordinary clinics have been held in the various Indian reservations throughout the state. An excedingly interesting one was conducted in Spokane at the Indian conference by members of your committee, and the clinic met with great approval by the Indians. It was very surprising to find the wonderful way in which the Indian women are keeping in touch with the progress of child welfare. Their acquaintance with proper food, clothes and management was very encouraging, as was their manifest desire to do the right thing for their children.

The purpose of the clinics throughout the state is entirely educational. Children needing attention are always referred to their family physicians. As soon as possible the communities should be responsible entirely for the conduct of these clinics by their own physicians and should not have to call for outside help.

The Committee has tried to put on a pediatric program in every county medical society of the state during the past year. We feel that three great advancements are being made in the maternity and infancy work in the state along the line of the

Preschool clinic, the
Prenatal education, and soon we will have to conduct
The Behavior clinic.

The Government has recently distributed two excellent outlines, one on the "Standards of Prenatal Care," which should be in the hands of every doctor in the state and one for the "Standards for Conducting Well Baby Conferences." If these outlines are studied carefully by the local physician, he will see that these conferences will be an enormous help to him in his general work.

The Committee has made an effort to acquaint the doctors, the laity and all of the legislators of the state of the wonderful work that is being done under the Shepherd-Towner Act.

The committee feels that the physicians of the state are neglecting a great opportunity in not spreading the propaganda of goiter, diphtheria, smallpox and scarlet fever prevention to a greater degree.

Much good educational work is being done at fairs and public gatherings in the display of various charts, etc.

The child welfare work is advancing rapidly through the influence of public health nurses of the state.

We have in the larger cities a number of permanent well baby clinics conducted by lay organizations. These are doing much in valuable educational work along the lines of child health conservation.

The May Day activities have also spread the propaganda of infant welfare work over the state.

From comparing the work of the Washington State Child Hygiene Division with the activities of all the other states of the Union, we feel as much is being done in this state as any of the states, according to the amount of funds at their disposal.

CONSERVATION OF VISION

Dr. Walter F. Hoffman, Chairman

Through the efforts of previous Committees on the Conservation of Vision ophthalmia neonatorum has been practically legislated out of existence. Our present law is good and not only makes the use of Crede's method of prophylaxis mandatory, but requires the reporting of all cases of inflamed eyes in infants. The public has been educated along this line and there is very little further to be done.

Industrial accidents we will always have, but they are being rapidly brought to the irreducible minimum through the efforts of the Industrial Insurance Department and agencies of that nature, which have an economic rather than an altruistic interest in such matters. The principal work that still remains is the examination and care of the school child's eyes. The progress of this work was given considerable impetus in 1925 through the publication of a very comprehensive report gotten out by the Joint Committee of the National Education Association and the American Medical Association on Health Problems in Education. This report has been printed and reprinted by the National Committee for the Prevention of Blindness and a copy should be in the hands of every superintendent of schools and each medical examiner throughout the state.

I have found that the fact that the report was participated in by the National Education Association makes it carry much more weight with the average teacher or superintendent of schools than it would have, were it simply the work of a medical committee or board.

If the program outlined in this report were carried out in the public schools, it would go a long way toward bringing about utopian conditions, as far as the eyes of school children are concerned.

Of course, considerable missionary work must be done on the part of the medical men specializing in eye work before the parents and educators can see the necessity or benefits of an eye examination program for school children.

During the past year members of this Committee have given talks over the radio and have spoken before Parent-Teachers' Associations, public service clubs and organizations of that character, wherever the opportunity presented itself. Unfortunately it is very difficult to get members of our committee to seek out the opportunities as well as give the talks. Probably the former is by far more difficult. If some separate organization could arrange for the audience, it would not be so difficult to get our medical men to give the talks. They are apparently either too busy or too modest to step out and seek the opportunities to address audiences on this subject. I hope that in the future the cooperation of medical men, other than those specializing in the eye or lay organizations, may be enlisted to provide the audiences for such talks.

GOITER COMMITTEE

Dr. E. S. West, Chairman

The people of the state, and especially, we might say, the doctors of the state, are a little slow in taking up goiter prevention; it is hard to get an organized effort. Easy to get a few, but hard to get the tablets given in the schools, where the masses can be reached.

In our own county this past year, we have used in the school 225,000 tablets. This work is now going into its fourth year, and we can begin to see marked results. In one of the smaller schools in the Naches district, a recheck of the goiter census this year shows a 100 per cent decrease in goiter incidence. The same results can be obtained anywhere, if only the doctors of the state would get in and do some hard work along educational lines. We are neglecting a real opportunity to do good.

MENTAL HYGIENE

Dr. D. A. Nicholson, Chairman

The Mental Hygiene Committee desires to report that they have had one thing definitely before them for the last few years, namely, the great need for additional space to care for feeble-minded children, there being several hundred such children at large in the State of Washington, many of whom have been examined and committed to the Custodial School at Medical Lake as far back as two or three years ago, but so far have remained at home because there are no accommodations for them in that institution.

Some progress was made with the Legislature last year and an appropriation made to purchase land for such an institution on the western side of the mountains. But this was vetoed by the Governor, and the work on the part of the medical profession, as well as other organizations, for the past two years has come to naught.

We hope the profession will keep this subject in mind and see what may be done at the next session of the Legislature.

HOSPITAL STANDARDIZATION AND SURVEY

Dr. H. E. Coe, Chairman

The work of the Committee on Hospital Standardization and Survey has been largely routine during the past year. Hospital standardization is an established and recognized condition, and when an organization or community desires to establish a hospital it is not necessary to sell the idea of standardization. It is only necessary to supply information. The ideals of standardization are so basic and sound that the hospital which wishes to be of the greatest possible value to the community and to render the highest type of service to the patient finds itself sooner or later following them. This has greatly simplified the work of this Committee.

A number of inquiries have been received from the Council on Medical Education and Hospitals of the American Medical Association and from the American College of Surgeons regarding various hospitals. These have been referred to the member of this Committee, in whose district the hospital in question is located and the answers forwarded.

The state is divided into thirteen districts with a member of this Committee in each district. The personnel of the Committee has changed very little from year to year, and since the work does not require much time, the information which each member gradually accumulates regarding the hospital situation in his district makes him increasingly valuable and able to answer inquiries with a minimum of effort.

There are at present 135 hospitals in the state listed by the American Medical Association, and of these twenty-seven are recognized by the American College of Surgeons as standardized.

Several of the hospitals are listed as being acceptable for internship, and this brings up a matter which should be called to the attention of every member of this Association who comes in contact with internes. An interne is not a species of glorified orderly. He is a graduate physician who has had his academic training and who is now depending upon us to round this out by giving him the clinical observations which our years of experience have shown us to be of value. Are we accepting this obligation? In many instances we are not. Many of us are shirking our responsibility. We must each do his part in giving the interne as good a foundation as possible, for he is soon to come among us as a fellow practitioner and his ability or lack of it will be a factor in raising or lowering the standards of our profession, and in determining the position which that profession holds in the eyes of the public. The interne is the representative of the staff man in the hospital. He should know the cases, not because he has dug out a history from a poorly written record, or has forced his way into the presence of the patient, but because he has been introduced to the patient by the attending man and has received his instructions directly. This establishes his status with the patient and makes him a valuable assistant. Most of us cannot hope to add to his education in a didactic way, but we can and we should give him the clinical training and critical supervision which he needs and has a right to expect from us.

Occasionally we meet with a poor interne, but in most instances an unsatisfactory interne is a direct reflection upon the attending man. Study of such instances will usually reveal that the attending man has not supervised the records or work of the interne. He has been vague in his orders, he has assumed a clinical judgment of the interne which is unwarranted, or he has not given the interne the benefit of constructive criticism. In a word, he has expected to get everything possible out of the interne without giving him anything in return. Internes are a valuable aid in hospital work. Twelve hospitals in the state are making use of them and their number will increase steadily. Let us not neglect our opportunities or shirk our responsibilities.

The name of this Committee is too long. The character of its duties can be clearly indicated by omitting the word "Standardization" and calling it the "Committee on Hospital Survey." It is urged and respectfully requested that the proper authorities take the necessary steps to change this name as suggested.

CANCER COMMITTEE

Dr. M. G. Sturgis, Chairman

Your Chairman of the Cancer Committee has to report that, working in affiliation with the American Society for the Control of Cancer, the state has been covered by the exhibition of a film entitled, "The Lucky Accident." This portrays the accidental discovery of cancer of the breast, and is a very interesting film; much more so than the previous one shown, called "The Reward of Courage." Lectures and talks, under the auspices of the various county chairmen, were given in connection with this.

In this connection the Chairman would urge that the Washington State Medical Association send to each of its members a handbook prepared by the American Society for the Control of Cancer, entitled "Essential Facts About Cancer." This handbook is prepared by a committee, consisting of Dr. R. B. Greenough, Director Harvard Cancer Commission, Boston, Mass.; Dr. James Ewing, Director of Cancer Research, Memorial Hospital, New York, and Dr. J. Wainwright, Chairman Cancer Commission, Pennsylvania State Medical Society, Scranton, Pa., and is furnished to physicians at actual cost price, about 19 cents per volume. This, while entailing some expense on the part of the medical society, will put into the hands of every member the latest facts and statistics regarding the scourage of cancer. Accordingly it should be of invaluable aid.

SOCIAL HYGIENE

Dr. C. F. Engels, Chairman

The principal activities of this committee have been in King and Pierce Counties, consisting of eighty-three lectures to a total attendance of eighty-five hundred people, nearly fifteen hundred pieces of literature distributed, and permanent placards posted in public buildings. There are well organized venereal disease clinics in many of the public institutions, both in Seattle and Tacoma. In one of our larger cities we now have systematic instruction on this subject by a physician in the schools. So much for the education of the public.

The committee still feels that the medical profession needs educating along this line. Hospital standardization was instituted to protect the patient and to prevent unskilled surgery. The committee feels that the time has come to standardize the treatment of venereal diseases, and we therefore wish to go on record as indorsing the following statements and suggestions.

THE TREATMENT OF GONORRHEA

The bringing about of a cessation of the urethral discharge is only a part of the treatment, and no evidence of a cure. The clearing up of a discharge is accomplished by various methods, including injections, irrigations, internal medicine.

This form of treatment alone will not cure infection in the glands of littre, prostatitis, seminal vesiculitis, epididymitis, gonorrheal arthritis, stricture, etc. These conditions require mechanical treatment and surgery. Focal infections in some of these parts may cause a chronic infection which may last over a period of years, with intermittent discharge.

Gonorrhea in the female presents a problem all its own. Vaginal treatment only will not rid the patient of her infection. Many of these patients have a chronic infection of the Bartholin glands, Skeene's tubules, periurethral glands and deep glands of the os uteri. Failure to clear up these glands of their infection means relapse and the persistence of the source of infection.

Venereal ulcers should never be treated until a definite diagnosis has been made, which includes examination for treponema pallida. All ulcers should be under suspicion as luetic until proven negative. This will include a blood Wassermann, covering a period of eight to twelve weeks after the infection. The treatment of syphilis must be thoroughly understood, must be persistent, and must cover a period of at least three years. The treatment must be fitted to the patient, there being no standard formula to cover all cases. This should be instilled into the mind of every syphilitic patient at the beginning of treatment, explaining why it is necessary. A minimum requirement for the discontinuance of treatment and observation of a syphilitic patient is a negative blood Wassermann, twice a year for five years, and at least one spinal fluid examination with negative findings. In this way we may hope to prevent some of the late cerebrospinal manifestations of the disease in our patients in their later years.

It would be well for a future committee to publish a booklet covering these points, giving an outline of standard treatment. This committee should have an appropriation to cover the cost of publication.

TUBERCULOSIS COMMITTEE

Dr. F. S. Miller, Chairman

At the beginning of the year all physicians engaged in antituberculosis activities were requested to make a careful survey of the work being done in their community to determine if the tuberculosis program already being conducted was sufficient and was covering the entire territory. While some of the districts were reported as already being covered adequately, in many it was found possible to extend the work into parts which either had not been reached or which had not been reached recently. Much of the time this year has been spent in completing and extending these home programs.

The work has consisted mainly of holding diagnostic clinics and giving lectures on tuberculosis. Lectures have been given to meetings of Parent-Teachers' Associations, Chambers of Commerce, Antituberculosis Leagues and public meetings under the auspices of various Tuberculosis Leagues. Such talks have been given in Grays Harbor, Pierce, Snohomish, Spokane and Stevens Counties. Although the established diagnostic clinics were found as a rule to be effective in reaching the people in those particular districts, a few extra clinics were conducted in some of the more remote places where difficulty had been experienced in reaching the patients.

Arrangements were made early in the year with the State Health Director to furnish chest specialists for all of the Department's baby welfare clinics. Such calls have been cared for, although at the present date but few have been received. More calls are expected and men will be furnished according to the agreement.

The Committee has attempted to interest physicians in the wealth of material at their disposal for the study of tuberculosis in the various sanatoria in the state. While a few respond to the invitations to visit the sanatoria and use the material to be found there, it is felt that the response has always been far too light in view of the value of the work to be found.

PUBLIC HEALTH AND EDUCATION

Dr. D. C. Hall, Chairman

The function of this committee is properly divided into two classes—reference and initiation.

From time to time there often arise grave questions relating to public health; questions in which the federal, state, county and city health officers are involved. Epidemics, real and threatened, are often of such a nature as to demand the cooperation of all for their suppression. It is in such times that this committee functions at its best as a go-between for the people, supporting and advising with the authorities and interpreting for them the various regulations that may be invoked. Public cooperation and the successful carrying out of ordinances are possible only so far as the family physician may direct, and his attitude must be moulded by his medical organizations.

INITIATIVE

There is an increasing need for public education and personal hygiene. The prevention of disease and fighting the insidious influence of quackery are among the crying needs of the day. Quackery and sophistry are supported by ignorance. The people must be informed along well-defined scientific lines, and this may be brought about by (1) Public lectures, (2) Compulsory courses in our institutions of higher learning.

A. Public Lectures.

Advantage is taken of every medical convention to arrange lectures to the laity by distinguished men: (1) The University Extension Medical Course, (2) The State Medical Association, (3) The Pacific Northwest Medical Association.

Material for the following lectures have been organized and are available for doctors who may be called upon or who may volunteer to deliver addresses: (1) From Test Tubes to Living Things. (2) What We Have Learned of the Heredity and Development of the Organism. (3) What We Have Learned of the Nutrition of the Organism. (4) The Adjustments and Unity of the Organism. (5) Preventing Sickness and Prolonging Life. (6) The Scientific Adtitude and the Public's Health. (7) Bubonic Plague. (8) Development of Medicine in the 19th Century. (9) Smallpox and Vaccination. (10) Tuberculosis. (11) Typhoid Fever. (12) Typhus Fever. (13) Yellow Fever. (14) Asiatic Cholera. (15) Hookworm. (16) Malaria. (17) Pellagra. (18) Diphtheria. (19) Scarlet Fever. (20) Meningitis. (21) Acute Anterior Poliomyelitis. (22) Vital Statistics. (23) Infant Mortality. (24) School Supervision. (25) Venereal Disease. (26) Martyrs of Medicine.

The following group of lectures has been organized and awaits only an opportunity for their presentation:

Topics and speakers—

1. The Development of Modern Scientific Medicine, Dr. Davidson.
2. Nervous Disorders, Early Signs of Mental Abnormalcy, Dr. Nicholson.
3. Preventive Treatment, the Recognition of and Attention to the Early Stages of Physical Troubles, Dr. Eagleson.
4. The Conservation of Sight, Dr. Wurdemann.
5. Goiter, Dr. Hall.
6. Cancer, Dr. E. J. West.
7. Tuberculosis, Dr. Griswold.

The Committee cooperates with the Council on Health and Public Instruction of the American Medical Association and the American Association for Medical Progress, Inc., a national lay organization.

B. Courses in our institutions of higher learning.

A survey made last year divulged almost a complete lack of hygienic teaching in our universities and normal schools. This field the committee recommends be developed at all hazards. Teachers should be well taught in laws of hygiene. Nothing short of a united effort by all interested bodies will be necessary to bring this about.

The development of the Gorgas Memorial augurs well along this line, and if we mistake not, its plans may be instrumental in establishing chairs of scientific hygiene in all our institutions of higher learning.

OCCUPATIONAL DISEASES

Dr. S. Griswold, Chairman

Reading the literature on industrial poisons soon convinces one that a broad knowledge of the subject is necessary to workers in every branch of medicine and surgery. Chemicals are used more and more in modern industrial life, and some of them are a menace to the health of those who use the manufactured product as well as those employed in the factory.

Lead and its compounds have long been known as poisons, but it is only recently that the importance of the mild cases of intoxication from this source have been appreciated. In diagnosis the history is of great importance and should include not only the occupation of the patient, but also include what chemicals are used. New methods are being introduced so rapidly that in many occupations poisoning may occur before those responsible realize that a new hazard has been created. To the old signs, such as lead line, constipation, colic, muscular weakness, wrist drop, have been added stippling of red blood cells, increase in the mononuclear cells and the finding of lead in the urine and stools. None of the findings are constant and the condition should not be excluded because of the absence of several of these symptoms.

Paralysis need not be confined to the arm, but seems most likely to occur in the muscles subject to the most fatigue. There are probably more than 200 occupations, in which lead poison may occur. Patients have been subjected to abdominal operations, appendicitis or adhesions, when the symptoms were due to lead poisoning in an occupation where the use of lead was unknown to the surgeon.

The most important industrial poisons in this state are probably lead, benzene (benzol) and carbon monoxide. Benzene is one of our best solvents and is used in paints, varnishes and as a rubber solvent. Can factories use it in making cans. It is also used in paint and varnish removers. Some of its derivatives are used in dyes for shoes and may produce poisoning in the wearer. Symptoms in these cases may resemble protein sensitization. In the acute benzene poison cases there is little difficulty in diagnosis, as the history is usually sufficient. In the chronic cases, particularly the mild ones, it is often difficult. Perhaps the most constant finding is leukopenia. Infection may, however, prevent this phenomenon. Other symptoms are dizziness, weakness, anemia, purpura, hemorrhage, prolonged clotting time. Some cases are diagnosed purpura hemorrhagica.

In all industrial poisoning the difference in susceptibility must be kept in mind. Some die and others recover quickly or are not affected at all, having gone through the same exposure.

Carbon monoxide poisoning may occur in mines and garages or in any occupations where gas burners are used. It should be remembered that a gas engine when running idle gives off more carbon monoxide than when working.

Acute poisoning is easily diagnosed. Chronic poisoning should be suspected when men exposed have headaches, weakness in their legs, nausea and dizziness.

PUBLIC HEALTH LEAGUE ACTIVITIES

Dr. C. H. Thomson, Chairman

This Committee was appointed at the last state convention for the purpose of coordinating the effort of the Washington State Medical Association with that of the Public Health League. The Committee has particularly concerned itself with a drive made to increase medical support to the League. Captains were appointed over the state and a campaign was inaugurated, which reached its high peak in November.

The results have been gratifying. King County registered the best gains, 90 having been added to the League roll from Seattle and vicinity. Spokane made good progress, as did Tacoma, and Yakima can boast of having the largest League membership of any society, with nearly 100 per cent registered on the rolls.

While increased and necessary support for the League was obtained in this drive, yet the need of a continued activity by the committee is imperative. The League is entirely dependent upon voluntary support for its existence and the continued aid of the different members of this committee is called for.

The Public Health League has had an active year. Splitting the biannual session of the legislature into two sessions required additional legislative effort and expense. Another session looms for next January and preceding that are the primaries and general elections. The selection of men who are sound on the issues of public health is demanded.

In the recent sessions all measures intended to cripple medical practice, to beat down license standards and to injure public health standards met defeat. The constructive measures offered by the League passed both branches of the Legislature by heavy majorities, but failed to get the approval of the Governor. It is expected that they will be offered next January with an excellent chance of becoming laws.

DECEASED MEMBERS

It was moved that a committee be appointed to draw up suitable resolutions for the deceased members. Seconded and adopted.

The following committee was appointed: Drs. C. R. McCreery, Chairman, D. H. Palmer, W. B. Penney.

LEGAL DEFENSE

In regard to Legal Defense, Dr. Thomson stated that it had been the policy of the Defense Fund to select its risks, that this policy has been subject to considerable criticisms and that it has been strongly urged that the Defense Fund be open to all members in good standing in this Association. The House was requested to discuss this matter and to come to a definite conclusion in regard to it. After considerable discussion it was decided to invite Mr. Cannon to talk before the next meeting of the House of Delegates, and that at that time a committee be appointed to consider the matter.

AMENDMENTS TO BY-LAWS

Dr. John O'Shea presented the following amendments to the By-Laws:

I suggest that Paragraph D, of Section V, of Article IV, of your By-Laws be amended by inserting in lieu of the present paragraph D, the following:

(D). That provision shall be made permitting each component society by vote of its members to accept applications for membership, on presentation of satisfactory evidence of membership and good standing of and in the other component societies of other State Associations affiliated with the American Medical Association, *provided* such applicant shall have complied with the laws of this State regulating the practice of medicine and surgery.

That Section 6 of Article V be amended to read as follows:

Section 6. Physicians living on or near a county line or in a county, where it is deemed impracticable to organize a society, shall be privileged to hold membership in that component society, whose meetings it is most convenient to attend, on permission of the society in whose jurisdiction he resides and that which he may wish to join. When a member in good standing in a component society moves to another county in this state he may, by majority vote at a regular meeting, be elected to membership in the society into whose jurisdiction he moves. In that event his name shall be transferred without cost to the roster of the latter society.

The proposed amendments were laid on the table for one day.

The House of Delegates then adjourned to meet the following day.

SECOND SESSION

Wednesday, June 30, A. M.

A quorum being present, the meeting was called to order by the President.

LEGAL DEFENSE

Mr. E. J. Cannon gave the following talk on the Legal Defense question:

The Washington State Medical Defense Association was organized to furnish protection to its members, if suits for damages are brought against them, whereever malpractice is unjustly alleged or where the physician seeks in court to recover compensation for his services and the former patient attempts to avoid payment for such services by setting up a false claim of neglect or ill-treatment. It is not the purpose of the association to lend protection to the incompetent or the negligent. It is its purpose to come to the defense of those careful, conscientious, industrious men who are the victims of a form of blackmail which seeks to destroy in a day the good reputation it took years to establish, and to secure damages for a condition for which the physician is not at fault.

It has other objects. The science of medicine and surgery is constantly advancing, more steadily than is any other known science. This advance depends largely upon the dissemination of new ideas and advancement of new methods. This can be best brought about by close association with those skilled in the profession, by criticism of methods, correction of dangerous ones, adoption of good ones. If one is charged with negligence or incompetency, men skilled in the science should examine into the facts and, if they conclude that the one charged was guilty of no wrong, the association in the interests of suffering humanity should protect him.

The association does to this extent. It secures attorneys for his defense, who know enough about the science of medicine or surgery to grasp the facts and it arranges for the attendance of men of the profession who can testify truthfully and convincingly because they know whereof they speak. If the man charged is found to be guilty by those selected to examine into the facts, the attorneys will be advised to adjust the claims in order that the litigation may be avoided and the wrong righted without creating distrust of and casting discredit upon the faithful members of the profession.

It is rarely that a suit is filed against the incompetent. He has little work to do and not many opportunities to do wrong. He is little known and has no reputation to lose and a dishonest plaintiff knows that such a man has no fear of losing a reputation worth so little and, therefore, cannot expect a settlement on that account and he is likely to be judgment proof as well. He, therefore, is quite immune. With the leader of the profession it is not so. He has many patients to minister to and many operations to perform. He is called in most serious cases and those most difficult to restore to health and out of a great number many are found that the best of service and greatest skill cannot completely restore. Some of these patients are ignorant or bad, or both, and perhaps have wicked advisors. The doctor values his reputation above price and these people know it. He is likely to have money and they believe he has, and they believe they can get some of it and also avoid paying their bill. Some of them honestly believe they have been mistreated and are the easy victims of designing persons. Therefore, it is the capable man who is most likely to be sued, and he is the one who needs protection.

This kind of damage claim is far removed from the ordinary suit for damages. Medicine is a science and surgery calls for scientific knowledge as well as skill. The layman has no knowledge upon the subject but thinks he has. Lay all the facts before him and his conclusion is as apt to be wrong as it is to be right, and since it is human nature to be suspicious of what we cannot understand and envious of those whom we believe earn their living easier than we do, the doctor's chance of getting a fair deal at the hands of a jury are not great.

In most damage cases the jurors can judge of the competency of the witness and the reliance they may place upon his testimony, but in the malpractice case the ignorant quack whom the plaintiff may be able to secure as witness can testify with an apparent profundity that the learned has not the audacity to attempt and the jury knows not the difference. The quack, therefore, prompted by envy or a small fee, or led on by ignorance and a desire to appear learned, makes a case for the jury where there is none in fact.

After many years of experience in defending cases of this character I can truthfully say that I have not known a good doctor or surgeon to testify in favor of a plaintiff. They have on more than one occasion asserted that the treatment given was faulty but they did so in such manner as to enable the attorney to bring about a fair settlement without a court trial and the plaintiff was much better off and the one at fault required to mend his ways.

The plaintiff's expert testimony is given by the ignorant quack seeking notoriety and a fee, or by an enemy of the defendant to satisfy a grudge, even at the sacrifice of truth. The quack cannot be curbed. His ignorance is his shield. The doctor who seeks the downfall of his enemy at the expense of his professional brethren should be disciplined. He is an enemy of the profession and of the public as well.

How can we avoid these suits? (1) By making them unpopular by avoiding the quack and by ostracizing the man who testifies to spite his enemy; (2) by exercising the utmost care in keeping a record which in case of trouble will enable one to show day by day the steps he has taken in the treatment of the case; (3) by keeping in operative surgery, especially in bone cases, an x-ray record of his work; (4) by calling in difficult cases to his assistance some good man to witness his work and to advise with him occasionally; (5) in treating female patients for the diseases of the sex, unless their reputation is well known to him, a female attendant should be present; blackmail along this line is often attempted; (6) by securing cooperation with some other man of standing who may be called, if the doctor is unable to attend emergency cases that have already been taken over by him for attention; (7) in infectious diseases by taking frequent cultures, if there is any doubt, and developing these cultures.

These measures will protect the individual. For the protection of other members of the profession one should not make adverse comments upon the work done. If the patient has been taken from another and turned over to him, he can do just as good work without complaining about the other man's shortcomings. I have found in almost every instance—in fact, I recall no exception—that the thought of a damage suit is prompted in the mind of the complainant by unkind or uncomplimentary remarks of some other physician; occasionally prompted by a desire of the other physician to earn a fee by mending the situation, which would perhaps be better without such mending.

Occasionally the doctor who creates the dissatisfaction, which eventually leads to suit, is one of those men who make their living under the title of "osteopath," "chiropractic," "natureopathy," or some other "opath," who has studied from sixty days to six months, or who claims to have studied that long, and deceives the public into the belief that he knows something about the human system and the treatment of the human body. These men, like the poor, we will have always with us. We can best handle them by apparently ignoring them, and at the same time watching them.

It may be claimed that to follow out these suggestions will not be of benefit to the public, but this is not the fact. The competent physician and surgeon should be able to practice his profession without the fear entering his mind day and night that some one will wrongfully charge him with neglect of duty. No man, whether he be lawyer, judge or doctor, can do his duty well if he is filled with fear. He should be in position to act fearlessly and courageously with the hope of saving life and curbing the ills that human flesh is heir to. Confidence in himself is essential. This is also true with the public. If those in suffering or sickness are inspired with confidence, they are much more likely soon to get well, and confidence cannot be imparted to the patient when the doctor himself is troubled with fear. Membership in a strong organization, to which he can turn for assistance when he is unjustly charged with wrong, encourages him to do better and bigger work.

The amendments as presented by Dr. John O'Shea were accepted.

The following Committee was appointed to study the Legal Defense question: C. H. Thomson, chairman, D. A. Nicholson, G. T. Dowling, J. H. O'Shea, S. L. Caldbick, C. J. Lynch,

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ELECTION OF OFFICERS

Tacoma was selected as the next place of meeting. The House of Delegates then proceeded to elect officers for the ensuing year. (Those whose terms did not expire are added to complete the list.)

President—Dr. H. G. Willard, Tacoma. Term expires 1927.

First V-Pres.—Dr. G. C. Miller, Seattle. Term expires 1927.

Second V-Pres.—Dr. W. A. Taylor, Ellensburg. Term expires 1927.

Sec.-Treas.—Dr. C. H. Thomson, Seattle. Term expires 1928.

Assist. Sec.-Treas.—Dr. J. H. O'Shea, Spokane. Term expires 1928.

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Dr. A. O. Loe, Seattle. Term expires 1927.
Dr. D. H. Houston, Seattle. Term expires 1927.

Second District

Dr. E. E. Hill, Walla Walla. Term expires 1927.
Dr. J. B. Munly, Spokane. Term expires 1927.
Dr. C. L. Smith, Spokane. Term expires 1928.
Dr. P. J. Gallagher, Spokane. Term expires 1928.

Journal Trustees—

Dr. George Dowling Seattle. Term expires 1927.
Dr. E. W. Janes, Tacoma. Term expires 1927.
Dr. Mitchell Langworthy, Spokane. Term expires 1927.

Delegates to A. M. A.—

Dr. F. Epplen, Spokane. Term expires 1927.

Dr. P. D. McCornack (Alt.), Spokane. Term expires 1927.

Dr. D. E. McGillivray, Pt. Angeles. Term expires 1928.

Dr. D. H. Palmer (Alt.), Seattle. Term expires 1928.

The House of Delegates adjourned sine die.

SCIENTIFIC PROGRAM

Tuesday, June 29

9:00 a. m.—Board of Trustees.

9:30 a. m.—House of Delegates and Committees.

11:00 a. m.—"Pituitary Syndromes" (with lantern slides). Dr. H. Lisser, San Francisco. Discussion by Dr. J. M. Blackford, Seattle; Dr. L. S. Gilpatrick, Spokane.

12:00 a. m.—Public Health League Luncheon and General Meeting.

2:00 p. m.—"Surgery of the Gallbladder," Dr. S. L. Caldbick, Everett. Discussion by Dr. A. J. Helton, Yakima; Dr. H. E. Cleveland, Burlington.
"Gastric Lesions," Dr. M. F. Dwyer, Seattle. Discussion by Dr. J. E. Hunter, Seattle.
"Abdominal Adhesions," Dr. H. J. Whitacre, Tacoma. Discussion by Dr. R. T. Congdon, Wenatchee.
"The Improvement of Our Poor Surgical Results," Dr. John Lyman, Walla Walla. Discussion by Dr. C. J. Lynch, Yakima; Dr. H. D. Dudley, Seattle.

7:15 p. m.—Dinner Dance, Davenport Hotel.

Wednesday, June 30

9:00 a. m.—House of Delegates, Election of Officers.

10:00 a. m.—"Empyema," Dr. Howard Lilienthal, New York City. Discussion by Dr. C. W. Sharples, Seattle; Dr. G. A. Downs, Spokane.

11:00 a. m.—"Etiology and Treatment of Non-Union of Fractures" (with lantern slides), Dr. C. D. Hunter, Tacoma. Discussion by Dr. C. F. Eikenbary, Seattle; Dr. L. L. Goodnow, Aberdeen.

2:00 p. m.—"Experiences in the Treatment of Tetany with Collip's Extract" (with lantern slides), Dr. H. Lisser, San Francisco. Discussion by Dr. George Miller, Seattle; Dr. Frederick Epplen, Spokane.

3:00 p. m.—"Observations in Disturbed Glucose Metabolism with Etiological Significance," Dr. C. H. Hoffrichter, Seattle. Discussion by Dr. E. W. Janes, Tacoma.
"Movable Kidney," Dr. Alexander B. Heppler, Seattle. Discussion by J. D. Windell, Spokane.
"Applications of Physiotherapy," Dr. Clarence A. Smith, Seattle. Discussion by Dr. Joseph Aspray, Spokane.

7:30 p. m.—Smoker.

Scarlet Fever Following Nose and Throat Operations. Of forty-eight cases classed as surgical scarlet fever at the Durand Hospital, from 1902 to 1926, Beatrice R. Lovett, Chicago (*Journal A. M. A.*, July 10, 1926), states that twenty followed operations, thirteen of which were on the nose and throat. Of these thirteen cases, seven were instances of scarlet fever following operations for cleft palate, two following resections of the nasal septum, and four following tonsillectomies. The intervals between operation and the first symptoms of the disease were: in two cases, two days; in six cases, three days; in two cases, four days, and in three, a few days. All patients had typical scarlet fever, and most of the cases were of the septic type. Complications were unusually numerous, including two instances of bilateral otitis media, two of unilateral otitis media, and two of sinus infections, making a total of six complicated cases in the series of thirteen.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

1925 Collected Papers of the Mayo Clinic and the Mayo Foundation, Rochester, Minnesota. Octavo of 1078 pp., 252 Illustrations. Philadelphia and London: W. B. Saunders Company, 1926. Cloth, $13.00 net.

Notwithstanding the enormous literary output of the Mayo Clinic nowadays, it has been possible by abstracting many of the articles and, where they possess most interest for the specialist, by inserting the title and reference to its original publication, to gather the substance of many thousand pages into one volume. In the beginning of the books there are many very instructive and practical monographs dealing with medical and surgical aspects of diseases of the stomach, duodenum, gallbladder and bile ducts. In relation to the liver, gallbladder and bile ducts much work has been done by the Mayo group in regard to the new liver function tests and jaundice. Judd ably presents the practical aspects of the surgical procedures in jaundiced patients and reviews the whole of our more recent knowledge concerning the formation of jaundice.

There is a splendid article by Carman on cholecystography, in which he covers the whole subject from his enormous experience with several thousand patients. He prefers the bromin salt by the mouth in ordinary capsules and the iodin salt intravenously, and finds the diagnostic results of the dye are about equal whether it be given by the mouth or intravenously. He also affirms that positive findings of a diseased gallbladder by absence of or faint shadow of the viscus are practically always confirmed by finding a diseased organ but, on the other hand, a negative finding by x-ray does not exclude the presence of a diseased gallbladder. Thus, in 10 of 17 patients in whom minor pathologic changes were found after cholecystectomy, the gallbladders appeared normal with the dye test and x-ray of the gallbladder, and in 7 patients only was the dye test positive. A positive dye test means disease of the gallbladder but a negative test does not necessarily exclude it and, in the presence of sufficient clinical evidence of cholecystitis, must be disregarded.

There is an abstract of the various papers by Greene, McVicar, Rowntree and Walters on liver function tests in patients with obstructive jaundice and cancer of the liver which is very conservative. It is apparent to the reviewer, from work done in this matter, that the quantitative estimation of bile pigment is valuable, and also the differentiation of hemolytic from obstructive and hepatic jaundice, both of which are possible by the van den Bergh test. But when one uses the dye retention test (bromsolphalein) to determine liver function, there is considerable doubt as to its worth. Thus in the study of the Mayo group, in 11 out of 18 patients with metastatic carcinoma of the liver there was retention of dye in the blood and, with a previous clinical diagnosis of probable hepatic cancer, this would be confirmative evidence. The writer has recently observed three patients with metastatic carcinoma of the liver, in all of whom there was no dye retention in the blood at all. It is estimated that the liver may function satisfactorily with one-fifth of its normal tissue, so that there may be great destruction of this gland without causing dye retention in the blood. The work of Mann in total removal of the liver has revolutionized our ideas on the formation of bile pigment, urea and many other accepted physiologic facts. The original contributions herein by Mann and his coworkers are epochal and will remain for all time as permanent additions to our knowledge of the physiology of the liver, and have already been adopted by authorities on the subject.

It is impossible to do more than notice a few of these hundreds of noteworthy papers and call attention once more to this last issue of what has become one of the most important and valuable medical publications anywhere to be found.

WINSLOW.

RECENT ADVANCES IN PHYSIOLOGY. By C. Lovatt Evans, D. Sc., M. R. C. S., L. R. C. P., F. R. S., Professor of Physiology at St. Bartholomew's Medical College, University of London. 69 Illustrations. Cloth 364 pp. P. Blakiston's Son and Co., Philadelphia, 1926.

This is one of a series of books on advances in various branches of medicine. There is no more important subject than physiology in its bearing on practical medicine and recent advances in therapeutics are generally dependent upon and follow new discoveries in it. This has been notable in thyroid and endocrine therapy in recent years, also in the use of the x-ray in gastroenterology, following Cannon's classic study of the physiology of intestinal movements by this means. So such works as the present volume carry much of value for every medical practitioner. In the earlier chapters there is a discussion of our more recent knowledge of the development and destruction of blood. The writer has much to say about the Kupffer cells in the liver and their chief importance in the destruction of blood and formation of bilirubin therefrom. He states that the bone marrow holds a very secondary importance in this process. But the latest work in this country by Bolman, Mann and Sheard goes to show that bile pigment is not chiefly formed in the liver but mostly in the bone marrow, less in the spleen, and least in the liver.

There is a very interesting and instructive chapter on the mechanism of postural reflexes and the functions of the labyrinth. Posture is based on reflex action and is usually without conscious effort, as when an animal is dropped and rights itself in falling. When total labyrinthectomy is done on an ape the animal behaves much as a normal one, after a short time, except that it is unable to right itself in falling or to orient itself in water. There are also chapters on the work and output of the heart, capillary circulation, tissue oxidations, muscular contractions and exercise, thyroxin, pituitary principles and insulin, and other subjects, all of which have an important bearing in the actual practice of medicine. A very useful and intensely absorbing little volume.

WINSLOW.

DISEASES OF THE SKIN. By Richard L. Sutton, M. D., LL. D., F. R. S. (Edin.), Professor of Diseases of the Skin, University of Kansas School of Medicine, etc. With 1147 Illustrations and 11 Colored Plates. Sixth Edition, Revised and Enlarged. 1303 pp. $12.00. The C. V. Mosby Co., St. Louis, 1926.

This edition gives the reader and student a concise as well as comprehensive review of the entire field of this subject. The newly discovered diseases are included, thus bringing the complete picture into the field of observation and up to date. The author has given generously of his own clinical experience and acumen, and includes authoritative observations of many scientists and authors, together with an invaluable list of references, convenient to the research worker progressing onward in this difficult branch of medicine. With the exception, perhaps, of the parasitic and mycotic diseases, the field is open in the direction of physiologic chemistry or pertaining to deranged ionic metabolism either primary inherent or secondary to bacterial toxemia.

The following subjects are especially worthy of note: Anaphylaxis, the leukemias, the tuberculides, syphilis, cutaneous cancer, smallpox, alastrim, foot and mouth disease in man, ratbite fever, diphtheria of the skin, keratosis gonorrheica and the mycotic diseases. The photographs and plates are clear and faithful in outline.

Future editions of this worthy book will probably note a further reduction of obsolete data and material relegated to the archives of dermatologic history and instead, in the light of further research and new material, a new chapter and new data with reference probably to hereditary predisposition and to physiologic equilibrium, the etiology and departure from normals included, in the fields of biochemistry and chemotherapy.

GABIE.

MATERIA MEDICA AND THERAPEUTICS. Including pharmacy and pharmacology. By Reynold Webb Wilcox, M. A., M. D., LL. D., D. C. L. Formerly Professor of Medicine, New York Post Graduate School and Hospital, etc. Eleventh Edition, Revised in accordance with U. S. Pharmacopoeia X, with Index of Symptoms and Diseases. Cloth, 798 pp. $5.00. P. Blakiston's Son and Co., Philadelphia, 1926.

This is a new edition of a standard and well known work which is characterized by its well considered concise style and authoritative reputation. The materia medica section is to be found in the first part of the book and the actions and uses of drugs in the latter portion. The work appears to be generally well up to date in most matters and there is a very excellent summary of the uses and indications of quinidine sulphate in auricular fibrillation. It seems rather curious that there is no reference whatever to insulin in the book, since it is almost as important as thyroid extract and is no longer an agent of questionable value.

There is also no mention of Lugol's solution in the treatment of exophthalmic goiter which has been

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pretty generally adopted, and the active principle of the thyroid gland is spoken of as iodothyrin, the author having overlooked the fact that now Kendall's thyrotoxin is commonly accepted as the thyroid active principle. The newer researches on the action of iron, and its failure to act more favorably when given intravenously or subcutaneously, or to increase hemoglobin in the blood of animals previously bled, are not mentioned. Perhaps this is as well because there is still some doubt as to the matter. Recent experiments, however, seem to prove that judicious feeding will form blood just as well as a similar diet plus iron. The book has been familiar to the reviewer for years and it is probably the best of the smaller and more concise textbooks on its subject for medical students and practitioners.

Winslow.

Actinotherapy and Allied Physical Therapy. By T. Howard Plank, M. D., Chicago, with illustrations. 459 pp. $7.50. 1926.

The author is one of our best-known practioners of physical therapeutics, having for years specialized particularly in actinotherapy. He states the prescribing of physical remedies to diseased conditions should not be left in the hands of technicians. The physician should familiarize himself with these methods, so that he may have an intelligent knowledge of their correct therapeutic applications. There are chapters in this volume dealing with diathermy, galvanism, sinusoidal currents and visible light, as well as infrared rays and radium. Under each are summarized the essential facts determining the application of the method under consideration. The body of the work is devoted to a discussion of actinic rays and their application in the treatment of disease. The chapter on physics of actinic rays reviews the literature with a summary of knowledge of this subject. About two-thirds of the text is concerned with the treatment of diseases to which physical methods are applicable, which appear in alphabetical order. The technic is given which the author employs in the treatment of each disease, illustrated by clinical reports of cases. This book is a useful and practical volume for anyone practicing physiotherapy.

Smith.

Collected Papers by the Staff of the Henry Ford Hospital. First Series, 1915-1925. 151 Illustrations, and 42 Charts. 634 pp. $8.00. Paul B. Hoeber, Inc., New York City, 1916.

While the monographs in this volume represent the first ten years' work of the hospital, yet most of them have been written in the last few years, as much time was necessary for the growth of the organization, and little was accomplished during the late war. The hospital, of about 500 beds, together with a group of buildings consisting of laboratory, nurses home, nurses training school, surgical pavilion, etc., are situated on some twenty acres. The officers of the hospital are Henry Ford, President, and Edsel B. Ford, Vice President, Secretary and Treasurer. The medical staff are on salaries, the reviewer is informed, and very good work is being done in medicine under Sladen, and in surgery under Roy D. McClure.

This collection of forty-three papers can not, of course, be compared with that of the great clinic of the country, and is handicapped by the number of years that have elapsed since publication of some, as the excellent articles by McClure on transfusion and its use with splenectomy in pernicious anemia, were both published some ten years ago. There are some good research contributions, as that on insulin action, by Mason and Matthew, and many practical clinical studies of value, as that of Clarke on syncope caused by auricular fibrillation. The cost of the publication will undoubtedly militate against its wide sale.

Winslow.

Fundamentals of Dermatology. By Alfred Schalek, M. D., Professor of Dermatology and Syphilology, University of Nebraska College of Medicine, etc. Illustrated with 54 Engravings. 239 pp. $3.00. Lea & Febiger, Philadelphia and New York, 1926.

As indicated by the title, this is not a treatise on dermatology. The author presents the fundamentals of this specialty in a concise manner. The diseases described appear in alphabetic order. Under each heading appear classification, definition, symptoms, etiology, pathology, diagnosis and treatment, each described briefly, the essentials only being included. The illustrations are a useful supplement to the text. It is a handy book for ready reference.

The Surgical Clinics of North America. (Issued serially, one number every other month.) Volume VI, Number III (Lahey Clinic Number—June, 1926). 214 pages with 54 Illustrations. Per Clinic Year (February 1926 to December 1926). Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

This number contains reports from the Lahey Clinic, representing New England Deaconess and New England Baptist Hospitals of Boston. Lahey presents seven papers, discussing toxic goiter, cholecystectomy, gastric and duodenal ulcers. Hamilton considers the chronic cardiac as a surgical risk and demonstrates that patients with severely damaged and failing hearts can be prepared and operated on without undue risk. In discussing organal cases he emphasizes that coronary occlusion may often suggest an acute surgical condition of the upper abdomen. Clute considers hyperthyroidism persisting after thyroidectomy and advises repeated examinations, both clinical and metabolic, for a year after operation. There are many other interesting and suggestive discussions in this volume.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho, Montana and Pacific Northwest Medical Association

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Vol. XXV SEPTEMBER, 1926 No. 9

ORIGINAL CONTRIBUTIONS

PULMONARY TUBERCULOSIS

SOME POINTS IN ITS TREATMENT BY SURGERY*

Howard Lilienthal, M.D., F.A.C.S.
NEW YORK CITY

This paper will be devoted primarily to the description and discussion of technical details but a few words must be added on the matter of fitting the procedure to the case as well as a short explanation of the mechanics of the operations and the results for which we hope.

Let us assume that, on the advice of a phthisiologist and with the concurrence of the surgeon, an operation is necessary to arrest the progress of a case of pulmonary phthisis. Let us also assume that the more ordinary methods, including hygiene and an attempt to produce artificial pneumothorax, have been unsuccessful. The burden is then upon the surgeon to select the procedure or sequence of procedures which may be expected to produce those mechanical and physiologic conditions which tend to promote arrest and fibrosis.

Two important results should be attained. First, the production of a state of rest with the consequent diminution of septic absorption and, second, the emptying and the continued drainage of the air passages and their associated pathologic cavities. Drainage can be accomplished either by expulsion of the discharges through the bronchial tree, trachea and mouth, or by a direct opening through the chest wall into the part to be drained, whether bronchus or cavity. The latter method will not be discussed in this paper.

Perfect rest with consequent and permanent abolition of pulmonary function may be secured with or without a great reduction in the size of the hemithorax, but loss of function together with drainage can best be secured by permanent and absolute compression of the lung. It must not be forgotten, however, that the mere presence of an empty cavity produced by erosion accompanying the disease in the substance of the lung is not necessarily a direct menace to life and does not need to be regarded as invariably progressive. If the walls of such a cavity are fibrotic and smooth without areas of granulation or ulceration, its existence may even be compatible with a virtual arrest of the tuberculous process. The obliteration of cavities, however, is ordinarily one of the desiderata.

As a rule, cases of phthisis are characterized by lesions in the upper chest and it is here that cavities are most frequently found. They nearly always begin posteriorly. Lesions in the lower thorax are, however, more serious because of the greater amplitude of the motion of the lower ribs in respiration. Indeed, the presence of a basal lesion on the least involved side is usually a contraindication for thoracoplastic operation upon the more diseased lung.

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* Read before the Fifth Annual Meeting of Pacific Northwest Medical Association, Spokane, Wash., July 1-3, 1926.

Tuberculous pneumonia with or without caseation is frequently benefited by collapse or fixation, although the most favorable cases are those of the fibrocavernous type.

I shall not catalogue the various conditions suitable for operation, for this subject alone would occupy much time and a great deal of space. It is enough to say that the chronicity or the rapidly progressive character of the tuberculous process may determine the advisability of operation, provided the opposite lung is not actively diseased and exhibits a sufficiently large healthy aerating surface to be consistent with reasonably normal life. Neither will the question of coincident disease of other regions be taken up here, except to point out that the mere presence of a tuberculous lesion in distant parts of the body is not sufficient contraindication to deny the patient the benefits of operation upon his pulmonary disease. It may, however, be said that in deciding upon operation a careful review of the individual case from all sides is far more important than the mere technical carrying out of the operative steps. I have refused no case in which the conditiins above stated were present, even though in several there was laryngeal, intestinal and even renal involvement and of these I have had an encouraging proportion of successes.

We will now discuss the more usual procedures which embrace thoracoplasty and its germane operations, of which the principal ones are phrenic nerve avulsion and extrapleural compression with apicolysis.

PHRENIC NERVE AVULSION

It has been found that instead of merely dividing or resecting the phrenic nerve, its more or less complete avulsion is preferable, principally because of the presence of accessory branches which are sometimes given off comparatively high in the neck and which join the main trunk after its entrance into the thorax. These accessory phrenic nerves are present, according to W. Felix, in about one-third of all individuals and many failures to secure paralysis of the diaphragm are due to the fact that ordinary section or resection of the nerve does not cut off this accessory supply. Since I have employed avulsion exclusively I have not noted a single failure in a list of sixteen consecutive cases.

It is important for the surgeon to familiarize himself thoroughly with the appearance and relations of the nerve before attempting the operation because the danger of mistaking another trunk for the phrenic is a very real one. I have heard of one case, in which the sympathetic nerve was resected in error and I, myself, once narrowly escaped dividing an abnormally small cord of the brachial plexus. The phrenic nerve lies upon the fascia of the scalenus anticus muscle and passes downward beneath the posterior belly of the omohyoid across the subclavian triangle and thence into the thorax It may, however, be so intimately connected with the fascia of the scalenus that it is difficult to visualize and it may even be found embedded in the muscle. The phrenic is a trifle larger than the graphite filler of the common mechanical lead pencils, although I have seen this nerve fully three times its normal size.

The surgeon is advised either to familiarize himself with the technic upon the cadaver or to perform his first few operations by exposing the trunk well above the omohyoid muscle through the more usual incision parallel with the posterior border of the sternocleidomastoid. Local anesthesia is sufficient.

When he has mastered this approach he will be ready to operate through a short (1.5 inch) incision made upon the upper border of the clavicle and parallel with this bone, the incision being placed so that its center will cross the posterior border of the sternocleidomastoid. With small blunt retractors the field is thoroughly exposed, one of the retractors drawing aside the sternocleidomastoid. The posterior belly of the omohyoid is now brought into view and retracted upward. This brings the surface of the scalenus anticus clearly into view. Its fascia is not very opaque so that the muscle appears through it, bluish in tint. The external jugular vein is to the inner side of the field. If the central retraction has been strong, the deep jugular vein may be seen but it is not necessary to expose this vessel. The nerve, however, is always well to the outer side of this vein when it is retracted as described. The phrenic is the only important nerve structure which passes across the subclavian triangle at the depth of the front surface of the anterior scalene muscle (fig. 1).

Grasping the nerve with forceps causes pain in the shoulder and occasionally down into the abdomen, but other nerves may also cause shoulder pain. Manipulation may produce dangerous shock, and, therefore, it is best to minimize the forceps dissection. Free the nerve carefully with dissecting scissors and then raise it from its bed by means of a catgut ligature passed around it with an aneurism needle. A little of the local anesthetic should then be injected into the nerve trunk with a fine

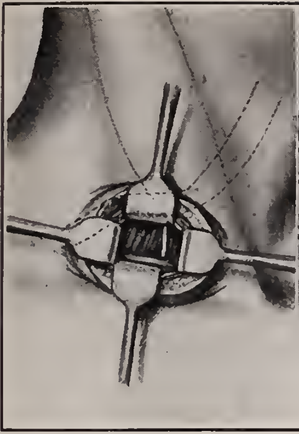

Fig. 1.

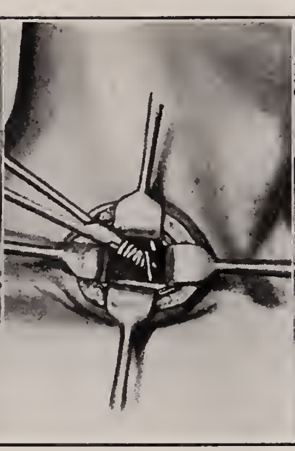

Fig. 2.

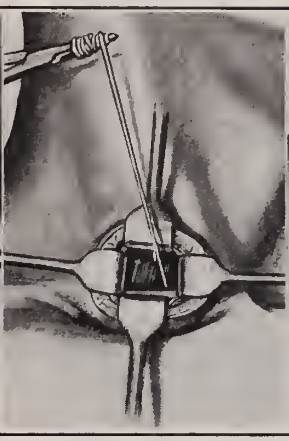

Fig. 3.

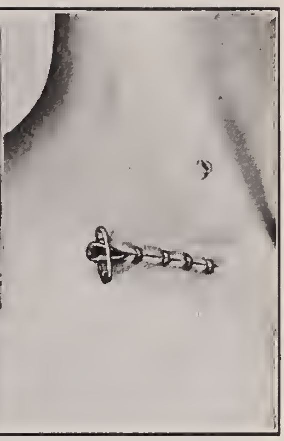

Fig. 4.

Fig. 1. Phrenic nerve avulsion. Dotted lines indicate sternocleidomastoid muscle and omohyoid muscle. The nerve is seen on the anterior scalene muscle and passes beneath the clavicle, whose upper border is here shown.

Fig. 2. Phrenic nerve avulsion. The nerve has been divided and the lower segment is being slowly reeled upon a clamp.

Fig. 3. Phrenic nerve avulsion. The nerve has given way in its distal portions and is being extracted.

Fig. 4. Phrenic nerve avulsion. The wound closed and drained.

needle, when the pain on handling will disappear. Using this catgut ligature as a tractor, the nerve can be more completely freed from its attachments and may then be grasped with a strong narrow jawed clamp and divided with scissors as high up as possible. Very slowly the clamp is rotated, winding the nerve upon it as upon a reel (fig. 2). There should be no haste. Considerable force will be required to avulse the nerve and the patient will usually complain of pain in the abdomen or near the heart. In three or four minutes the attachments will rather suddenly give and the entire nerve will come away (fig. 3). On examination by floating it in water it will be seen to consist of several filaments, usually two main ones.

Occasionally the nerve breaks off at a distance of four or five inches below the clavicle and, while this is disappointing, the length of nerve removed will probably prove sufficient. If the avulsion is carried out slowly enough this rupture is not liable to occcur.

During the dissection of the subclavian triangle the vascular structures occupying the lower part of this space should be carefully avoided, especially the branches of the thyroid axis. Reference to works on anatomy is advisable before undertaking the operation so that these vessels may be recognized, for the opening is small and deep and the wounding of even a small arterial branch adds greatly to the technical difficulties.

The nerve having been extracted, the wound in the skin is closed with very fine sutures or, still better, metal clips and a tiny piece of split rubber drainage tube should be placed in the depths emerging at the posterior angle so as to get rid of postoperative exudate (fig. 4). This tube may be removed in forty-eight hours.

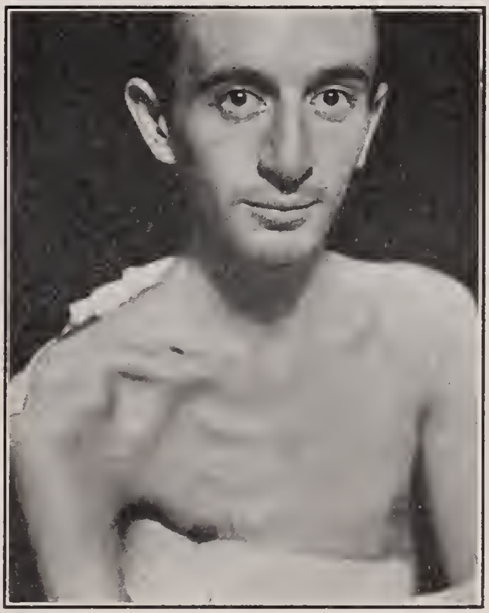

Fig. 5. Phrenic nerve avulsion. The short and inconspicuous scar immediately following the operation.

Tuberculous lymph nodes are sometimes found in this region. They add materially to the anxieties of the surgeon and they should be cleared away for the sake of perfect exposure. A small pledget of gauze held in place by two or three straps of adhesive plaster is all the dressing required and after the third day simply painting with new-skin usually will be sufficient protection (fig. 5).

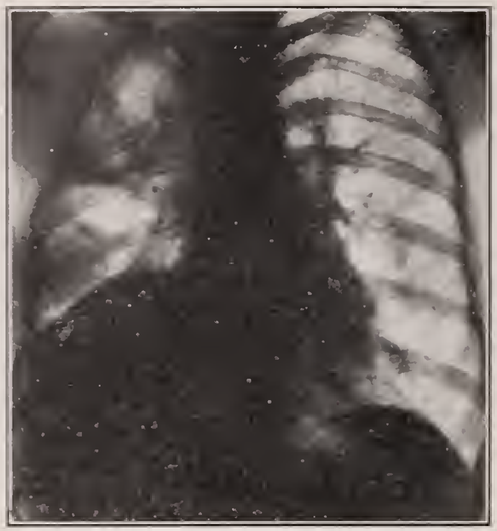

Fig. 6. Shows immediate elevation of diaphragm following right phrenic nerve avulsion. There has also been a first stage (upper) thoracoplasty. The effect is usually even more marked on the left side.

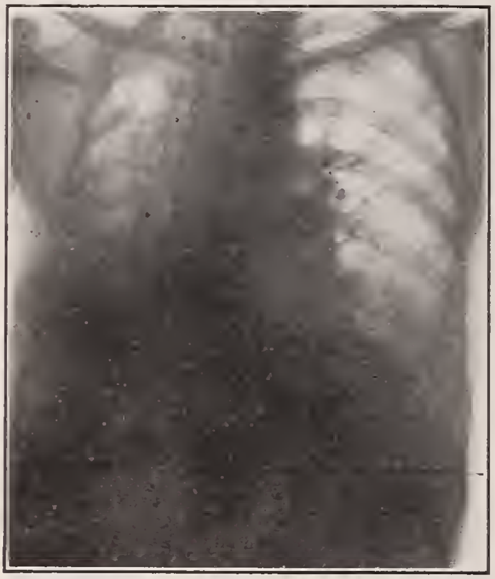

Fig. 7. A later picture of the same patient after completed thoracoplasty, showing secondary involvement of the contralateral lung at the base. Patient recovered in spite of this.

Fluoroscopy in the erect posture at any time after the first twenty-four hours should demonstrate a general rising of the diaphragm on that side but with respiratory motions exactly opposite to those of its fellow (paradoxic motion) (fig. 6). An increase in elevation of the phrenic dome of from 1.5 to 2 interspaces will reduce the intrapleural negative pressure and may be considered equivalent to an artificial pneumothorax of from 200 to 400 c.c. or more.

If the lesion is on the left side, it is well to have the patient swallow a glass of carbonated water immediately before the radiography. This will insure the presence of a gastric bubble and will aid in locating the dome of the diaphragm.

Following this operation we may expect improvement in the patient's subjective sensations, the degree depending largely upon the preoperative mobility of the muscle. A diaphragm fixed by adhesions may yield slowly or even not at all.

The tendency to hemoptysis is reduced and cough is usually relieved although, naturally, it does not disappear. Expectoration is ordinarily not interfered with.

The greater the relief following this operation the better are the hopes for success after the completed thoracoplasty. A few cases have been reported, in which an arrest of the tuberculous process appears to have resulted from this simple procedure.

In selecting phrenic nerve avulsion as an operation antecedent to thoracoplasty, we should by preference choose cases in which the diaphragm is not fixed by adhesions. This is of far greater importance than selection according to the location of the disease as some have advised. It makes little difference whether the lesion is in the lower or upper part of the chest, for the main object of the phrenic interruption is to reduce the size of the hemithorax and to lessen its negative pressure.

PARAVERTEBRAL COSTECTOMY

The technic of the usual steps in this operation has been so frequently described that it is hardly necessary to enter into its details at this time. We will discuss certain points, however, which it is important to bear in mind.

The ribs must be resected subperiostially. This is essential because, if the ribs are removed with their covering, there is great delay in subsequent union and the mobility of the chest wall is greatly prolonged, if, indeed, rigidity ever occurs. As I have frequently stated, the reduction in the capacity of the pleural space is not entirely dependent upon the length of the bone sections removed (fig. 8), but is produced by the change in the direction of the ribs toward the vertical so that in a fully successful case the greater part of the rib length is almost parallel to the long axis of the body (fig. 9; see also figs. 12, 23, 28 *et al*).

It must also be recalled that the division, at least, of the first rib is a necessary element of the program because this structure tends to support all the ribs below it. When the first rib has been divided, its cut ends rarely unite with each other except by a long vertical bridge because the distal end of this rib drops far below the point of resec-

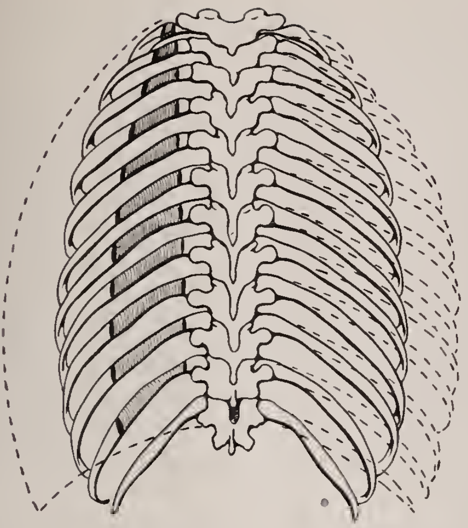

Fig. 8.

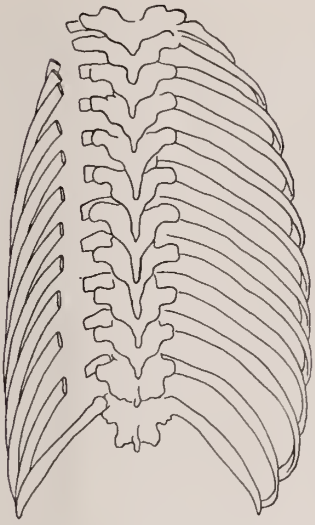

Fig. 9.

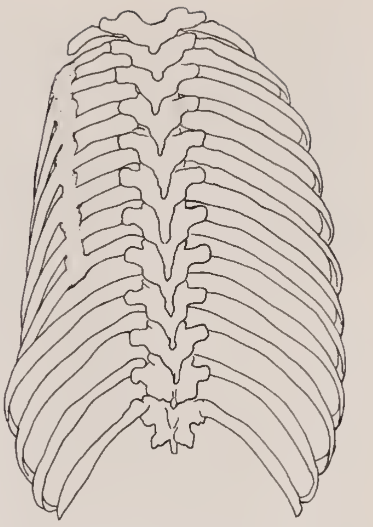

Fig. 10.

Fig. 8. Paravertebral thoracoplasty, showing length of sections removed from various ribs. (Shaded parts represent resected portions.)
Fig. 9. Paravertebral thoracoplasty, showing what happens immediately after rib resections. Note that the first rib is now on a level with the second interspace, that all the ribs have moved toward the central line and have assumed exaggerated obliquity.
Fig. 10. Paravertebral thoracoplasty, long vertebral rib stumps making for fixation with less compression. Fixation of thorax accomplished by bony ridge between ribs. This in a case in which the lower ribs were not cut.

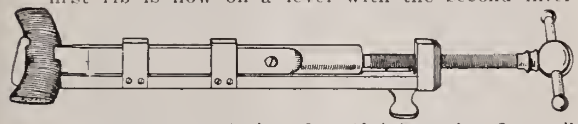

Fig. 11. Author's guillotine for dividing the first rib (from Surgery, Gynecology and Obstetrics, December, 1925), showing method of application to the rib.

tion (fig. 9; see also figs. 10, 17, 28 *et al*). It frequently unites with the stump of the second or even the third and all the ribs eventually become connected by a continuous bridge from above downward. Thus, even when the spinal or posterior costal stumps are left fairly long, rigidity of the thorax follows (fig. 10).

In dividing the first rib, which is the most delicate part of the thoracoplasty, it must be completely denuded of its periosteum in the place where it is to be cut and in making this denudation the greatest gentleness must be observed to prevent contusion of the brachial plexus or even injury to the subclavian vessels.

Various instruments have been devised for minimizing the accidents which may occur at this stage. Most of these belong to the forceps or shears type. Tiemann has made a guillotine according to my directions which works with a slowly acting screw and, when this instrument has once been set in position, nothing but the bone itself can be cut (fig. 11).

In peeling the periosteum from the other ribs it is also imperative that the pleura beneath be not injured. A periosteal stripper for the upper and lower borders of these ribs has been devised by Dr. John Alexander which protects the pleura during this part of the operation.* In stripping the periosteum from the upper border of the rib the direction should be from behind forward and for the lower part from before backward. Freeing the lower edge of the rib is much more difficult than stripping the upper, especially the parts near the angle, where strong fascial and ligamentous attachments are firmly fixed to the bone.

PROPER SEQUENCE OF THE STAGES OF THORACOPLASTY

There has been some divergence of opinion as to where the thoracoplastic work should begin, whether in the upper chest or in the lower. Sauerbruch and others advise that, especially in the two-stage procedure, the lower ribs should be taken first for the main reason that they believe, when the upper chest is primarily compressed, a spilling into the lower part of the lung from the emptying of the apical cavities might prove disastrous.

Against this view, however, there are the following arguments:

1. The main lesion is much more commonly found in the upper part of the lung and, if this is first compressed with great improvement in the patient's condition, we may postpone the second stage; or, if from six to eight ribs have been taken, it may prove unnecessary ever to complete the thoracoplasty, especially when a phrenic nerve avulsion has antedated the thoracoplasty. I have adopted

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* The Surgery of Pulmonary Tuberculosis. John Alexander. Lea & Febiger, 1925.

this course in a number of instances and Alexander has advised phrenic nerve avulsion with the resection of only the upper eight ribs as a routine procedure, unless there is very great involvement of the lower part of the lung.

2. The removal of the first rib being so important in securing the proper collapse, it should be resected primarily.

3. The postoperative reaction following the resection of the upper five or six ribs is, for mechanical reasons, less pathologically disturbing than the mobilization of the lower part of the chest because the amplitude of respiratory motion is much smaller above than it is below and interference with the expulsion of secretion by coughing is much less when the support of the lower ribs is still intact. The patient will have partly adjusted himself to the changed conditions by the time we are ready to resect the lower ribs; and also there has usually been by this time a distinct reduction in the quantity of sputum.

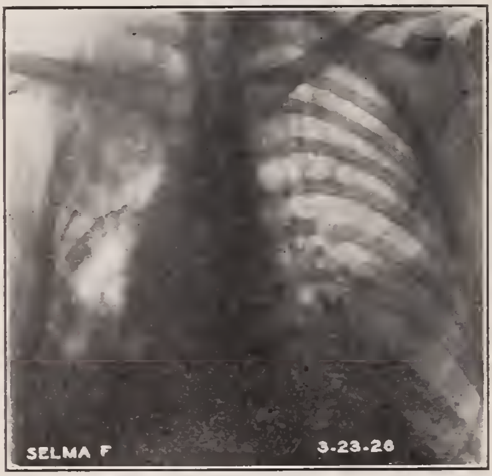

Fig. 12. Case of Selma F. Left thoracoplasty for rapidly breaking down caseous tuberculosis. This picture shows an acute contralateral pneumonic process which appeared only a few days after the last stage of the operation. This proved to be tuberculous in character.

4. The danger of pushing the mediastinum toward the healthy lung is a less important factor after the upper than it is after the lower resection.

5. It is a good surgical plan, other things being equal, to perform the more difficult part of an operation at a first stage than at a second; and it is a relief for the patient to know that the hardest part of his ordeal is over.

I have found that by following this order the liability of inducing a contralateral pneumonia or tuberculous exacerbation is far less than when the first stage is begun in the lower thoracic segment. I have, however, encountered this unfortunate complication in one case (see fig. 12 and its legend). The patient was a seventeen year old girl with rapidly advancing disease.

As a little point of convenience I would advise that, after the lowest rib has been resected in a first (upper) stage thoracoplasty, a heavy silk ligature should be passed around the next (uncut) rib below and that the ends of this ligature, knotted together, should be left hanging out of the lower angle of the wound or even buried beneath the skin, so that it may be a guide in orientation during the second stage. This will save time and manipulation, for without such a marker it is necessary to lay bare the lower part of the original operative field to make sure that no rib has been missed (fig. 13).

At the first stage of the thoracoplasty, I advise beginning with the 3rd or 4th rib, then proceeding upward until the first has been divided and after this continuing the resections downward for as many ribs as may seem advisable. At the second stage, unless the patient's condition is very poor, the 10th rib should be first attacked, the sequence now passing upward until the rib marked by the ligature has been reached and resected. The 11th should be the last rib to be cut.

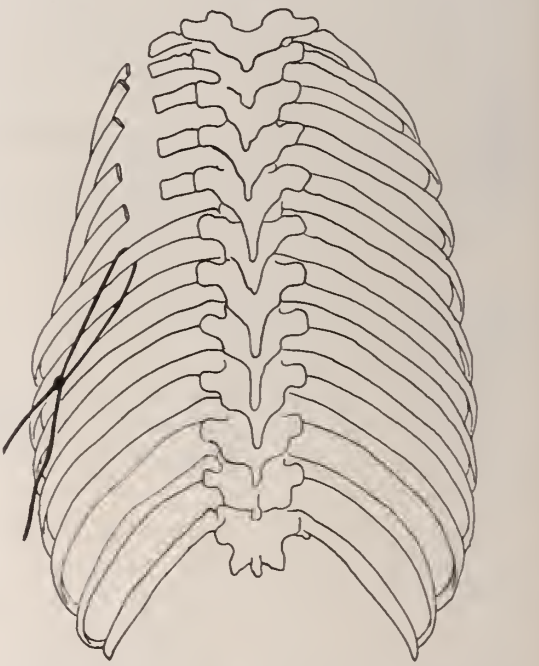

Fig. 13. Paravertebral thoracoplasty first (upper) stage, showing silk ligature as a mark for orientation at the next stage.

The interval between the two stages is by preference less than ten days so that callus may not have formed with premature stiffening of the chest wall. Still, if the patient has not regained his strength and confidence, a longer period may be permitted to elapse. The blood pressure is a useful guide. Fever alone should be no contraindication to proceeding with the second stage.

Hemostasis. It has been my custom to clamp and ligate all bleeding vessels and to drain at the lower angle with a multifenestrated tube, passing beneath the muscular layers of the back which will have been approximated by interrupted stitches of chromicized catgut. This prevents the formation of hematoma. The tube may be removed in forty-eight hours. In spite of the greatest care in securing the vessels there will be considerable oozing, but with this system of drainage clot formation need not be feared, for all of the blood and serum will escape at the lower angle.

The cutaneous wound should be closed with a few sutures or with sutures and metal clips. In my last four operations I have covered the line of union with a long strip of folded gauze, not more than 1.5 inches in width, and have made compression with elastic adhesive plaster (to be had under the trade name of elastikon), then covered the whole with a more voluminous dressing. This plaster, while it gives excellent support to the now flapping chest wall, is not as uncomfortable for the patient as the ordinary adhesive plaster. The elastic plaster should be in strips long enough to pass to the midline of the body front and back, and the ends should be kept from curling up by short strips of plain adhesive plaster overlapping an inch or two of the elastic and passing an inch or two beyond upon the skin (fig. 14). The elastic plaster should be two to three inches wide and these original strips may be kept in place for from one to three weeks.

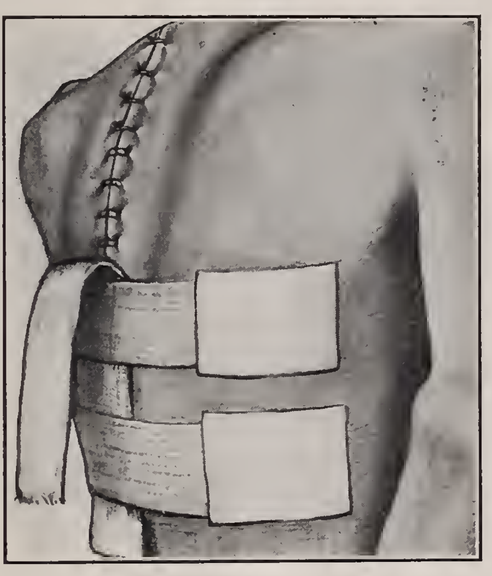

Fig. 14. The dressing immediately after complete paravertebral thoracoplasty illustrating use of elastic adhesive plaster (see text).

The dressing can be easily changed by drawing the plaster away from the body with a clamp, withdrawing the gauze and replacing it by a new piece. To keep the elastic plaster from adhering to the gauze it may be covered for about two inches with a piece of the cloth or crinoline facing (figs. 18 and 19). The firm yet elastic compression is a great comfort to the patient.

Should cyanosis or dyspnea follow soon after the operation, say within twelve hours, we may assume that one of its causes, if not the chief one, is the forcible displacement of the mediastinum. The plaster should then be removed and replaced with less tension. This danger is greatest in cases of caseous or pneumonic consolidation. I recommend continuing the elastic compression for several months after the wound is healed.

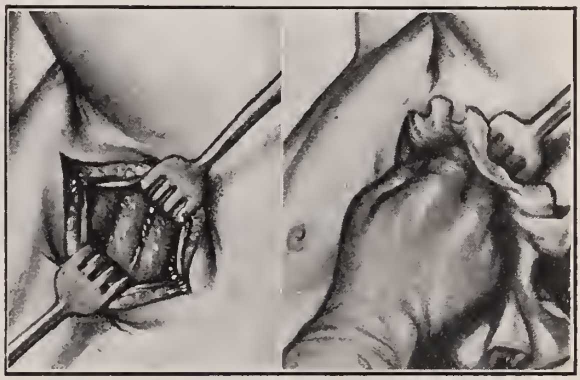

Fig. 15. Fig. 16.

Fig. 15. Technic of apicolysis following thoracoplasty. Note obliquity of ribs.
Fig. 16. Apicolysis has been accomplished and the extrapleural cavity is being filled with a large sheet of folded rubber dam.

Improvement following thoracoplasty progresses for months, sometimes for nearly a year, and coincidentally there is gradual contraction of the area of lung transparency on x-ray examination so that often an apparently complete pulmonary obliteration is the final result.

Occasionally, however, an apical cavity may still remain open and, if it is believed that this is producing pathologic symptoms, further compression is advisable. This can best be done by a direct extrapleural compression through an incision in the anterior axillary line. The operation is not a difficult one nor is it as dangerous as when apicolysis is performed as a primary procedure, because the liability of wounding the partly collapsed pleura is not so imminent. Two or three ribs must be resected subperiostially, remembering that these ribs

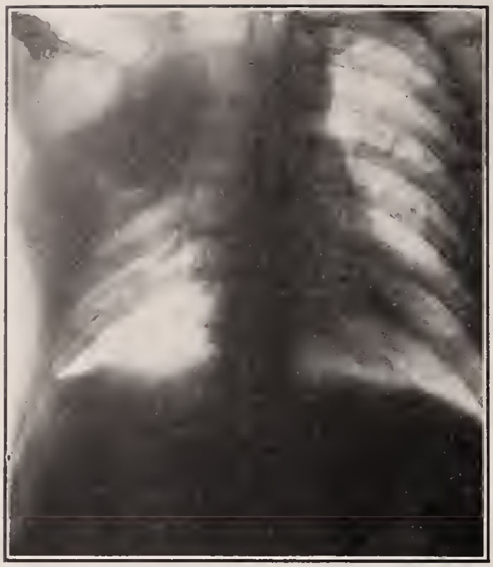

Fig. 17. Skiagram of apicolysis, following thoracoplastic resection of the first six ribs. The cavity was not fully collapsed and, therefore, the apicolysis was done and the hollow filled with iodoformized paraffin. The wax was later removed and patient made a complete recovery. Note union of resected first rib with stump of second. Lower part of lung practically healthy. Diaphragm adherent to chest wall.

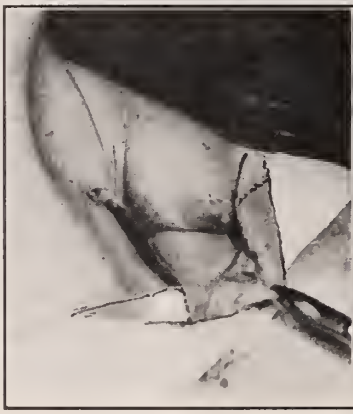

Fig. 18.

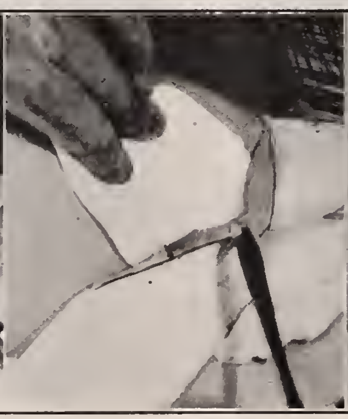

Fig. 19.

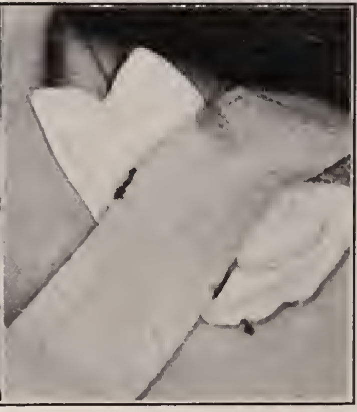

Fig. 20.

Fig. 18. Apicolysis. Dressing the wound with the aid of elastic adhesive plaster. A part of the plaster has been withdrawn without removing it, exposing the wound.

Fig. 19. The new dressing has been drawn beneath the plaster after packing extrapleural cavity.

Fig. 20. Dressing completed. The plaster makes compression without encircling the chest.

now run in an extremely oblique direction (fig. 15). The segments removed should be from 1.5 to 2 inches in length. With the finger the periosteum and underlying tissues should be very slowly and carefully compressed toward the spinal gutter, stripping away the structures from the inner surfaces of the ribs. Unless the cavity is extremely large, it can thus be practically obliterated. The extrapleural space should now be firmly packed with crumpled up live rubber dam, upon which a piece of gauze is laid and the mass prevented from forcing its way out of the chest by adhesive strapping. In four or five days the gauze and rubber dam may be removed and daily firm packing with gauze alone substituted. The expansile force of the rubber will have materially enlarged the dead space. New bone will form along the depressed periosteum and the hollow in the chest wall will become rigid and permanent.

Figure 17 is an x-ray picture of a case, in which iodoformized paraffin was used as a fill. It gradually came away and the cavity was finally treated with packings as above described. The patient made a perfect recovery. An adjuvant in dressing these cases—and in dressing other wounds of the chest in which an encircling bandage is disadvantageous—is the elastic adhesive plaster, as demonstrated in figs. 18, 19 and 20. The same piece of plaster can be used for a week or more and the patient's skin is saved the irritation of frequent removal of strips. At the same time firm pressure is assured.

Figures 21 to 26 with their legends illustrate points in relation to paravertebral thoracoplasty. The pictures are presented in lieu of histories.

In speaking of thoracoplasty I have thus far referred only to cases in which there was no purulent pleural exudate. This complication may be the result of infection during the induction of artificial pneumothorax or it may be a spontaneous condition arising from pulmonary fistula. If attempts at disinfection by emptying and washing the pleura through a needle are futile, then the problem becomes one of empyema. Mixed infection is the rule and thoracotomy is almost always necessary. Drainage having relieved the fever and cough, thoracoplasty is indicated not so much to compress the lung, which will commonly be found already thoroughly collapsed, but to obliterate the discharging pleural sac. The steps of the operation are about the same as those already illustrated, but every pre-

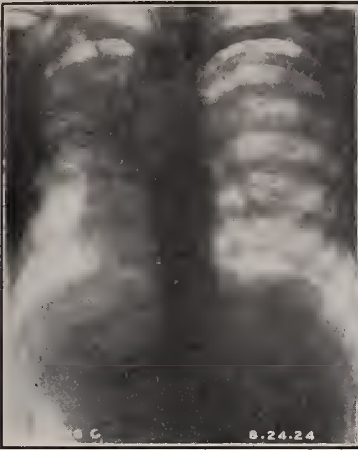

Fig. 21.

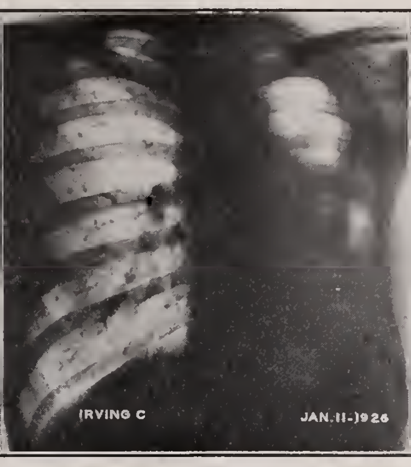

Fig. 22.

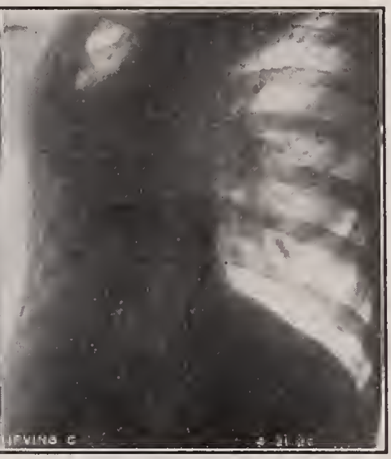

Fig. 23.

Fig. 21. Case of Irving C. August, 1924. Pulmonary tuberculosis most advanced on the left side, where it is of the early fibrocavernous type. Infiltration on right as well. Partial left pneumothorax.

Fig. 22. Case of Irving C. Nearly one and a half years later. January, 1926. There is now a large cavity in upper part of the left lung. Small pneumothorax in midchest. The lesions in the right lung are now calcified.

Fig. 23. Case of Irving C. Four weeks after thoracoplasty. The collapse became much more marked during the following three months. There are good chances that the already reduced cavity may become obliterated.

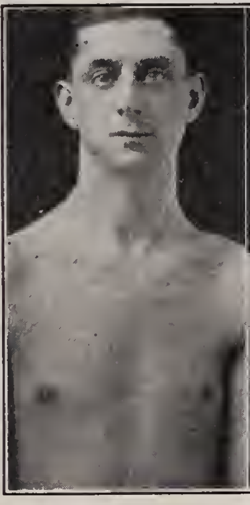

Fig. 24.

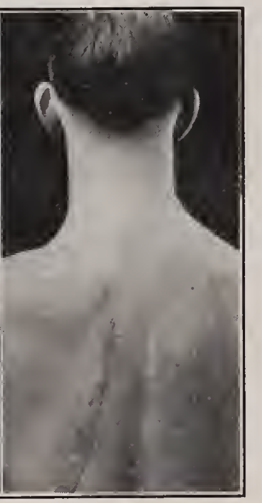

Fig. 25.

Fig. 24. Case of Herbert M. Four months postoperative. Result following complete paravertebral thoracoplasty, showing the small degree of external deformity; drooping of left shoulder and slight contraction of chest. Operation done for fibrocavernous disease with frequent massive hemoptyses.

Fig. 25. Case of Herbert M., showing scar.

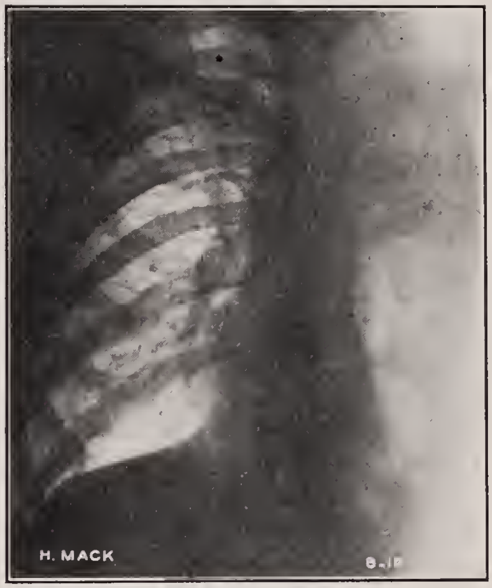

Fig. 26. Skeletal deformity in preceding case. Compare with photographs.

caution must be taken not to infect the wound from the nearby thoracotomy. It is also best to remove longer sections of rib than in the uncomplicated pulmonary cases. Secondary resection may eventually be required to produce complete obliteration.

An instance of this type of lesion is that of Dr. S. V., age 45, who after nine years of tuberculosis, through a great part of which he had bravely carried on an exacting country practice, was suddenly put to bed by a sudden bronchial perforation into the pleura. While both lungs had been affected, the process in the right had gone to a complete arrest.

When I saw him there was a great deviation of the mediastinum, cough, and profuse foul expectoration. The x-ray findings were characteristic (fig. 27). Several aspirations gave relief and on account of the apparently large bronchial fistula I thought that a thoracoplasty might finally drain the pleura through the mouth by way of the bronchus.

The upper six ribs were resected with the aid of local anesthesia. Little relief followed, however, and I then performed a low thoracotomy for drainage and a few days later completed the thoracoplasty. Convalescence was uninterrupted and the patient was discharged only two months later. Of course, he will have to wear his tube for a long time. He was up and about with no fever and without cough and was rapidly gaining in weight. A test with Dakin's fluid through the tube before his discharge from the hospital produced no cough so it is hoped that his bronchial opening has closed. (Figs. 27 and 28 are from skiagrams made before operation and afterward.)

I cannot leave the subject of the surgery of tuberculosis of the lungs without saying something about the treatment of these patients, especially those of the poorer class, in general hospitals.

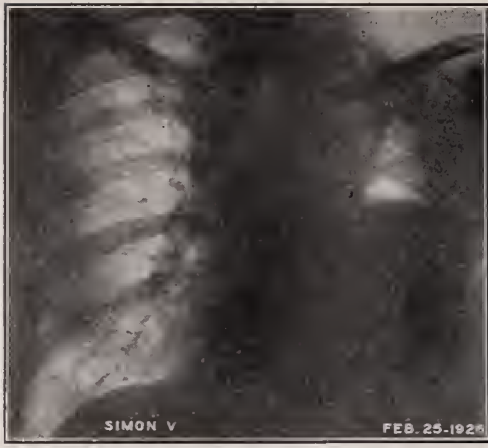

Fig. 27.

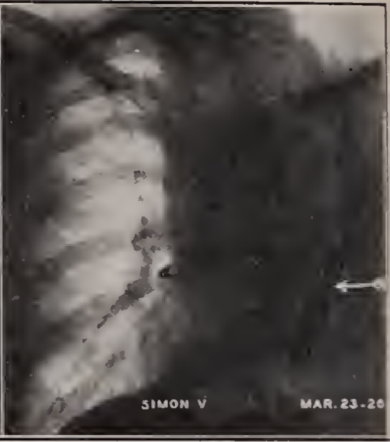

Fig. 28.

Fig. 27. Case of Dr. S. V. Old left fibrocavernous phthisis; contralateral healing with calcification. Note fluid level of spontaneous putrid pyopneumothorax. The result of perforation.

Fig. 28. Case of Dr. S. V. Following thoracotomy for drainage and paravertebral thoracoplasty to obliterate the pleural cavity. The arrow points toward the drainage tube within the now almost obliterated pleural sac, represented by the rarefied vertical area.

It must be conceded by all who have looked into the matter that, while in isolated cases the home may be suitable for the care of the tuberculous, yet the mass of phthisical patients will do far better in the atmosphere of the scientifically administered sanatorium, that is, until it comes to surgery. Then we have a different problem and one which can only be solved under the conditions present in a general hospital, where not only the operation itself but the many complications, often unexpected, which can occur during the surgical progress of the case may be controlled.

To mention just a few of these, there are recurrent or secondary hemorrhage from the wound, tense pneumothorax, the necessity for transfusion either to tide over an emergency or as a less urgent therapeutic measure. There are various untoward events depending upon occasional wound infection; the possibility of the formation of empyema or even the necessity for opening a tuberculous pulmonary cavity, the outlet of which may have been interfered with by a thoracoplasty. These are but a few of the complications which may occur in the surgical treatment of phthisis. Medical problems are such as enteritis and nephritis or the requirement of special treatment by a laryngologist or an otologist.

Of course the ideal condition would be a combination of sanatorium with hospital facilities, an extremely unusual thing. With the methods of modern travel, good roads and comfortable easy running ambulances, the journey from the suburban sanatorium to the metropolitan hospital is easily borne. Indeed, in two cases of my own, patients with active hemorrhage have been thus transported and have been successfully operated upon to be returned to the sanatorium as soon as the surgical wound was healed, the tendency to hemorrhage having been eliminated.

Merely to illustrate a single example of what may happen, let me report briefly the case of a young man with a left sided old fibrocavernous tuberculosis with frequent hemorrhages. He came to the hospital and, following a left phrenic nerve avulsion, I performed extrapleural thoracoplasty in two stages. The unusual accident of infection occurred but sterilization was rapidly progressing and the wound looked well when on the tenth day, following a sharp cough, there was bleeding from an eroded intercostal artery. The house officer at once responded to the call with an emergency outfit and promptly caught the vessel.

I admit that the same quickness of action might have been possible in a sanatorium but I think that all will concede that the patient's chances were far better in a place where surgical emergencies are dealt with as a routine. The transfusion which followed was a matter of no difficulty. The hematologist was merely called upon, a suitable donor was provided, and two hours after the hemorrhage 800 c.c. of whole blood had been given and the patient's general condition was far better than it had been before the mishap.

The fear of infection by the tubercle bacillus for neighboring patients, at least in adult wards, under ordinary precautions is negligible. Indeed, the late Dr. Trudeau once said to me that he believed there was no place in which an individual would be more safe from contracting the disease than in a well managed sanatorium for tuberculosis and this, of course, would hold in the adult wards of a general hospital. Manifestly, as soon as the surgical treatment has been completed, the patient should be sent back to the more salubrious environment of a sanatorium.

We do not hesitate to admit tuberculous empyema, discharging tuberculous wounds of other parts of the body, the kidney, the major articulations, cases of syphilis, gonorrhea, actinomycosis. It is only the unfortunate patient with *pulmonary* phthisis, against whom this archaic discrimination is made. Our profession should work toward correcting this injustice.

THE PRESENT STATUS OF THE RADIATION TREATMENT OF CARCINOMA*

George W. Holmes, M.D.
Richard Dresser, M.D.
BOSTON, MASS.

Department of Roentgenology
Massachusetts General Hospital

Within the past decade, rapid advancement in the knowledge of the purely physical properties of radium and the x-ray has been made. It is now possible for the roentgenologist quickly and easily to obtain a measurement of the intensity of the x-ray beam after it leaves the tube, and to determine the wave length and penetration of this beam. Thus, x-ray dosage has been removed from the field of uncertainty, and placed upon an exact and scientific basis. Our knowledge of radium is no less precise. A wealth of data have been collected, from which charts have been prepared, covering every requirement of practical application.

The biologic effect of radiation is, unfortunately, not so well worked out. Extensive research, however, is being carried on in this field. The subject is comprehensively dealt with in an article by Ewing which will be freely quoted in the following pages, and to which the reader is referred for more detailed information. Our present knowledge may be summarized under the following headings: first, the effect on the cancer cell; second, the effect on the surrounding tissue; third, the effect on the organism as a whole; fourth, the effect of intensity and wave-length.

THE EFFECT ON THE CANCER CELL

It is a well established fact that embryonal cells, and malignant cells approaching the embryonal type, are much more susceptible to radiation than are adult, well differentiated cells. It is also known that cells are most vulnerable at the time of mitosis and division. In addition, there is a profound effect on the resting cell, and there is some evidence to show that this may be of a cumulative nature, becoming manifest when the cell breaks into activity. It is believed by some that small doses of x-ray or radium have a stimulating action on malignant cells; there is, however, no scientific basis for this contention. That the cancer cell may become highly resistant to radiation, following repeated, sublethal doses, is well recognized. An explanation of these phenomena on a purely physical basis has not yet been arrived at.

THE EFFECT ON THE SURROUNDING TISSUE

Not less important than the direct killing action which radiation has on the cancer cell is the effect on the surrounding tissue. Those who have seen the color fade from a nevus, following radium treatment, will appreciate the profound effect which radiation has on vascular tissue. The obliterating endarteritis which follows irradiation undoubtedly plays an important part in cutting off the blood supply to certain tumors, and may account for the destruction of neoplastic tissue, following doses far too small to effect a cure by direct action on the cancer cells.

The lymphocyte plays an important role in limiting the spread of cancer; the area of round cell infiltration which surrounds active foci of malignancy has long been recognized as a protective mechanism. The lymph node is nature's filter for cancer cells, and it is interesting to note that normal lymph tissue is very resistant to radiation. Indeed, there may occur true lymphoid hyperplasia, following heavy doses of x-ray and radium.

Ewing has observed marked plasma cell infiltration in heavily irradiated tissue, and regards this as a favorable prognostic sign. If the reaction is excessive, it is pathognomonic of radiation healing.

The end product of the various cellular reactions is the formation of connective tissue, which in certain instances may go on to an undesirable extent.

Fat is very resistant to irradiation, and cannot be excited to favorable cellular reaction.

Bone is fairly resistant, but if overdosage occurs, indolent and painful necrosis may follow.

Nerve tissue appears little affected, even by heavy radiation.

The intestinal mucosa is particularly susceptible, and for this reason special care should be observed when irradiating the abdomen.

THE EFFECT ON THE GENERAL ORGANISM

This is a very important factor in radiation therapy, and one which is too often overlooked. Debilitated, anemic subjects respond less favorably to treatment than do those in good general physical condition. We are convinced that too long, or too heavy irradiation may so impair the general health of the patient that the malignant process is not retarded, but on the contrary progresses with greater rapidity. On the other hand, there is much evidence to show that carefully chosen and properly administered doses may favorably affect the organism as a whole.

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* Read before the Fifth Annual Meeting of Pacific Northwest Medical Association, Spokane, Wash., July 1-3, 1926.

THE EFFECT OF INTENSITY AND WAVE-LENGTH

It has been shown by Wood that from five to seven times the dose tolerated by the normal skin must be administered to certain cancer cells in vitro, if complete sterilization is to be produced. There are certain accessible lesions, to which it is practical and safe to apply such drastic treatment. For example, in skin epitheliomata we do not hesitate to give five times the erythema dose of unfiltered x-ray, provided the lesion does not extend over too large an area. There follows some ulceration which heals within a few weeks, leaving no trace of malignancy. The result is permanent in a large proportion of cases. This most spectacular form of irradiation accomplishes its purpose mainly by direct destructive action on the neoplastic tissue. We need no longer concern ourselves with those who assert that acccessible, localized malignancy cannot be completely destroyed by irradiation.

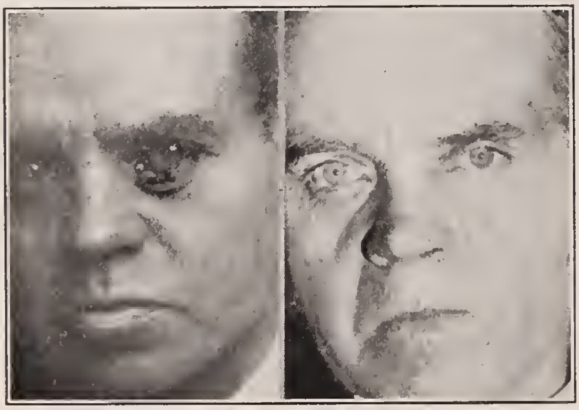
a Fig. 1. b

Fig. 1, a. Epithelioma of lower lid before treatment.
Fig. 1, b. Complete disappearance after insertion of radium needles.

It is evident that there are many lesions to which this method cannot be applied, either because of inaccessibility or proximity to especially vulnerable normal structures. In this event we must content ourselves with smaller doses, relying to a greater degree on the reactions of the surrounding tissues and on the general resistance of the patient. This form of dosage has been subject to many variations and modifications, but that all of these may be effective is attested by the frequent disappearance of malignant tumors following its use. It seems highly probable that different wave lengths exert somewhat different biologic actions, although proof of this is not conclusive. In general, we may assume from clinical observation that long wave x-rays ("soft," unfiltered rays) and the beta rays of radium have a caustic, burning effect, tending to destroy all tissue with which they come in contact, and having little selective action on malignant cells. The wave lengths of the gamma rays of radium are very short, and appear to exert a destructive effect upon neoplastic tissue with comparatively little injury to surrounding normal tissue. The shortest x-rays yet produced do not equal the gamma rays in "hardness," although they tend to approximate their effects. For this reason it seems desirable to use heavily filtered rays, wherever injury to normal tissue must be avoided.

The roentgenologist is caled upon to treat a great variety of conditions, and since it cannot be expected that he be proficient in all branches of medicine, it is necessary that he collaborate with a group of men trained in the various specialties. He must solicit aid from the pathologist, internist, surgeon, and dermatologist in order that a proper diagnosis may be established, and the right treatment instituted.

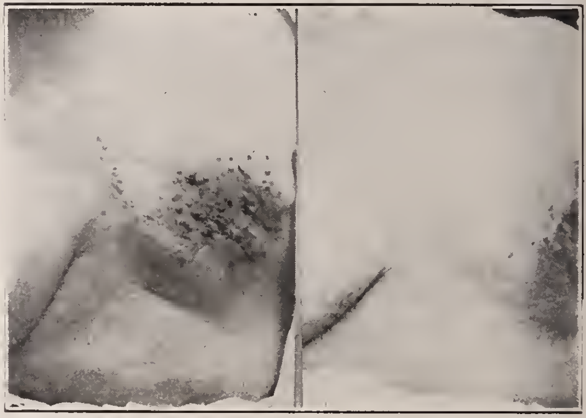
a Fig. 2. b

Fig. 2, a. Cancer of the breast with postoperative skin recurrence.
Fig. 2, b. Patient alive and free from superficial recurrence two and one-half years after irradiation.

Patients with cancer may be divided into two main groups: first, those which may be cured or greatly benefited by irradiation; second, those which show no response to treatment, and in which irradiation is contraindicated.

Group One. Numerically, carcinoma of the breast stands foremost in this group. Five hundred and sixteen cases have been treated in our clinic. Of these, the great majority have been postoperative recurrences, or have been referred for postoperative prophylactic treatment.

Surgical removal offers the best chance of cure in cancer of the breast, provided the case is one in which complete removal is possible. A large number of the cases which we see, however, have had unsuccessful operations. Not a few of these present themselves with a widespread dissemination of the disease which it seems reasonable to assume is caused, to some extent at least, by a breaking down of the natural barriers following surgical manipulation. That unoperated cases of cancer of the breast do much better under irradiation than those which have had incomplete surgical removal is a common observation in our own and other clinics. We wish to emphasize that the surgeon should use great care in selecting his cases, and only those cases should be operated on, in which there is a reasonable chance of complete removal of the entire area of disease.

Preoperative treatment may be of value, but we have not yet given it a thorough trial. There are two dangers to be avoided: Time enough should elapse between the irradiation and operation to allow the patient to recover from any roentgen sickness which may develop. Surgical shock and radiation sickness developing concomitantly may be more than the patient can withstand. The vitality of the normal tissue is lowered, and the operator must keep this fact in mind to avoid sloughing of skin flaps and delayed healing.

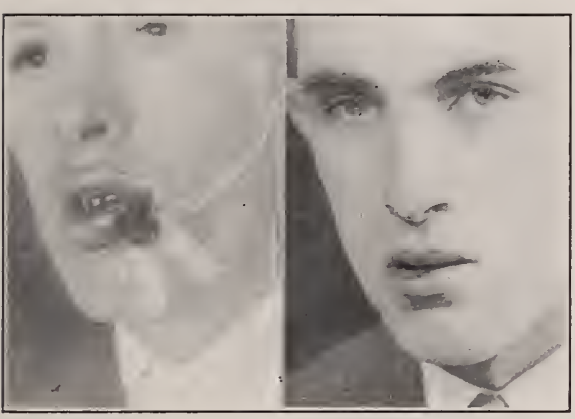
a Fig. 3. b

Fig. 3, a. Cancer of lip. Local lesion treated by radium, glands in neck treated by short wave x-ray.
Fig. 3, b. No visible or palpable evidence of disease eight months after treatment.

Inoperable cases often do remarkably well under irradiation. We have seen large masses in the breast disappear, and it is not unusual to obtain healing of a foul, ulcerating lesion. Metastasis in the axilla and neck does not respond so readily, although frequently there is a diminution in the size of the growth, with alleviation of pain. When the mediastinum and lungs are involved, we feel that irradiation is contraindicated. The pain resulting from bone metastases is often relieved, following moderate doses of short rays, although we have never observed any retardation in the progress of the disease.

Postoperative recurrence in the skin generally responds to heavy doses of x-ray or radium, and may be made to disappear completely and permanently, although the patient almost invariably dies of more distant metastasis.

Cancer of the lip responds rather better to irradiation than does cancer of the breast. The local lesion is so situated that it may be irradiated externally from three angles; it is also easy to apply interstitial irradiation. The primary growth can be as surely and completely destroyed by irradiation as by surgery, and with less sacrifice of normal tissue.

The treatment of the glandular metastasis presents greater difficulties. The commonly employed method is dissection of the neck. If the surgeon is fortunate enough to remove the entire growth, all goes well, but if there is recurrence, there are no lymph glands to hold the disease in check, and it may travel with great rapidity. Our results in the treatment of neck metastasis, using moderately heavy doses of copper filtered x-ray, have not been encouraging. Regaud, however, reports favorable results from epidermicidal doses of heavily filtered x-ray. Ewing has seen sterilization of carcinomatous glands, following full doses of x-ray and radium combined.

The recent work of Simmons and Daland on the microscopic grouping of carcinoma of the lip is of interest. They find that the ultimate prognosis is dependent more on the pathologic nature of the lesion than upon its extent. Three groups are made, according to the differentiation of the neoplastic cells; group one is the least malignant and group three the most malignant, with group two intermediate. If the growth falls within the first group, the chance of operative cure is good; if it belongs to group three, the patient is practically sure to die, regardless of the extent of involvement at the time of operation.

Since the undifferentiated cell is the one most susceptible to irradiation, we should expect group three to respond to x-ray and radium. Theoretically, a rational form of treatment would be to first determine the nature of the growth. If it is fairly benign, operate; if it is very malignant, irradiate.

Carcinoma of the mouth offers somewhat the same problem as does carcinoma of the lip. If favorably situated, the local growth can be destroyed by interstitial irradiation, although this form of treatment may occasion almost intolerable suffering. Most of our efforts in this group have been directed toward palliation. By the intraoral administration of heavily filtered radium we have, in many instances, been able to effect at least a temporary disappearance of the growth without causing undue discomfort to the patient. Alcohol injection of the branches of the trigeminal and even intracranial section of this nerve has brought great relief from suffering to many of this group, and opens up a field in which far too little has been done.

Many of our cases of carcinoma of the pharynx and larynx have been considerably benefited by high voltage irradiation alone, or combined with radium. The end results are, however, uniformly bad.

The pain in carcinoma of the colon is often relieved by x-ray, although it alone, in doses which can be safely administered, seems to exert no influence on the progress of the disease. If the growth is located accessibly in the rectum, it can often be held in check by a combination of radium and x-ray. Operation offers the only hope of permanent cure.

All cases of carcinoma of the cervix uteri which enter the Massachusetts General Hospital are now being treated by irradiation. Our experience with this group is as yet limited, and no final conclusions can be drawn; however, the reports from a number of the leading clinics both in this country and abroad show that twenty per cent of all cases treated are permanently cured. When the fact is considered that a large number of these cases are hopeless from a surgical standpoint, these figures would indicate that irradiation is the method of choice. Carcinoma of the body of the uterus is best treated by hysterectomy.

Our series of carcinoma of the bladder is small (45 cases). The results from irradiation have not been particularly satisfactory. Only a few of these tumors have shown regression under x-ray alone, and the implantation of radium has resulted in undesirable reactions. Waters, however, reports good results following massive doses of short wave x-ray, and Young has had success with surface applications of heavily filtered radium, applied by means of a specially designed cystoscope.

Certain cases of malignant cystadenoma of the ovary, giving rise to generalized abdominal carcinomatosis, do remarkably well under radiation. The relief, however, is only temporary.

The pain occasioned by carcinoma of the prostate is often relieved by irradiation. The growth cannot be retarded by x-ray alone; however, Young reports a number of cures following combined x-ray and radium treatment.

We have had little experience with the treatment of carcinoma of the penis. Excellent results from irradiation are reported from the Memorial Hospital in New York.

Group Two. Those cases which are not suitable for irradiation.

Various methods of treating carcinoma of the esophagus have been tried, but none has proved satisfactory. The implantation of radium emenation tubes is followed by ulceration which may extend through the wall of the esophagus, and cause death from mediastinitis. The application of filtered radium, held within the lumen of the esophagus, is fraught with unsurmountable technical difficulties. A few of our cases have seemed to do well for a short time under deep x-ray treatment, but the majority show no response. We believe that gastrostomy, when swallowing becomes difficult and the general nutrition begins to suffer, offers the best palliation in this type of case.

Carcinoma of the stomach is not suitable for irradiation. The gastric and intestinal mucosa is very susceptible to the action of the rays, and doses sufficient to affect the malignant growth may cause severe damage to the lining of the gut. The same applies to neoplasms of the liver and pancreas.

Primary carcinoma of the lung is affected little, if at all, by irradiation. Evans and others have reported injury to the lung following heavy irradiation over the thorax.

It is important to remember that we are treating the patient as well as the disease. Careful attention should be paid to the general nutrition, and roentgen sickness should be avoided in so far as possible. In the majority of cases we find it advisable to extend the treatment over a period of a week or ten days, giving from one-fourth to one-half an erythema dose only at a sitting. In treating over the abdomen, it is often necessary to administer even smaller doses. Those cases which are complicated by pyogenic infection usually do poorly under irradiation. All sources of infection should be cleared up as completely as possible. This applies particularly to cancer of the mouth.

The selection of the proper wave length must be given careful consideration. In general, superficially located lesions such as epitheliomata should be treated by unfiltered x-ray or lightly screened radium. Considerable necrosis will follow, both of the tumor and of the normal surrounding tissue, but as previously stated, satisfactory healing will occur, provided the area is not too large. In locations where secondary infection is likely to occur, as in cancer of the mouth, this necrosis is a very undesirable feature. Here it is better to use heavily filtered radium or x-ray which has a more selective action on the malignant tissue. Deep-seated, inaccessible lesions are best treated by short wave x-ray.

All cases of malignancy, whether treated by irradiation or surgery, should be observed at frequent intervals. We have recently organized a special clinic composed of radiologist, surgeon and internist to handle this follow-up work.

CONCLUSIONS

1. In general, it may be stated that irradiation with x-ray or radium may be used as a curative procedure in a small, carefully selected group of cancer cases. Its principal field of usefulness, however, is as a palliative measure, in inoperable and recurrent cases.

2. The cases selected for curative treatment by irradiation should be that group in which surgery has failed because of the high malignancy of the tumors, or mortality of the operation. To this may be added a small group, in which the results from irradiation are known to be better than those of surgery.

3. In the palliative treatment of incurable cases, both the surgeon and the radiologist should remember that the object of the treatment is to relieve suffering and to prolong life when possible, and that radical measures which increase suffering are rarely justifiable.

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RADIOTHERAPY AND THE GENERAL PRACTITIONER*

ARTHUR U. DESJARDINS, M.D.
ROCHESTER, MINN.
Section on Radium and Roentgen-Ray Therapy
Mayo Clinic

The value of any method of treatment depends on the results obtained by its use, and such results are in large measure proportional to the soundness of the principles on which the method is based. This is as true of radiotherapy as of any other branch of medicine and surgery. Unfortunately, though perhaps inevitably, the average physician has neither the time nor the opportunity to keep abreast of the developments in all phases of medicine. Hence it is but natural that he should not be acquainted with the fundamental principles underlying certain methods of treatment, which, because of their highly technical character, are (as they should be) the more or less exclusive province of specialists. However, if the general practitioner is to make intelligent use of such methods for the benefit of his patients, if he is to know when to refer patients to a specialist, he should possess a general understanding of them, and he should know in what conditions they are particularly useful and the probable range of their usefulness.

Among members of the profession generally there is some confusion concerning the relative advantages of radium and roentgen rays in the treatment of many diseases. In a previous paper[2] I showed whence came the impression of conflict between these two agents, what are the advantages of each and what the physical considerations on which these advantages rest.

The maximal usefulness of radium is limited to a short radius. The chief indication of radium is, therefore, for lesions or tumors of limited size, the extent of which can be determined with a fair degree of accuracy, and which are on or near the surface of the body or accessible from the outside. It is most beneficial when it can be introduced directly into the substance of the lesion in such a manner as to deliver to every part an adequate and fairly uniform dose. Sometimes radium can be concentrated in one large unit, but generally the implantation method is more effective, whereby many units, each containing a small quantity of radium element or emanation, are introduced at regular intervals throughout the tumor.

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* Read before the Forty-eighth Annual Meeting of Medical Association of Montana, Billings, Mont., July 16-17, 1926.

If the lesion is large, or if, as in many malignant growths, its shape is irregular and its extent ill-defined, and especially if it is below the surface, roentgen rays are more efficacious than radium, although in many cases both agents can be combined advantageously. Also tumors or lesions deep within the trunk, whether thoracic or abdominal, are more effectively treated with roentgen rays, and this in spite of the great radiosensitiveness of certain forms of tumors.

The choice between radium and roentgen rays in dealing with benign lesions rests on their extent, volume and depth. Radium is more suitable for small keloids, while roentgen rays are preferable for large keloids.

Concerning roentgen-ray treatment, a fertile source of confusion lies in the use of such expressions as "deep therapy" which, to specialists in radiology, carries no meaning, because all roentgen-ray treatment is more or less deep according to the spectral composition of the rays employed. Originally intended as a synonym for treatment by means of high-voltage roentgen rays, it is now frequently employed by physicians without such reference and it were, therefore, best discarded altogether.

During the last five years many radiologists have equipped themselves with high-voltage roentgen-ray generators. This step was a perfectly rational one, but instead of reserving short wave-length ray treatment for suitable patients, many committed the blunder of subjecting to such treatment patients with every form of disease supposedly amenable to roentgenologic treatment, regardless of its nature and situation. Roentgen-ray treatment must be adapted in quality as well as in quantity to the effect desired, and, according as we are dealing with a condition at the surface or at varying depths beneath it, we must select the portion of the roentgen-ray spectrum which will be absorbed most completely at that level, because, as is well known, only those rays that are absorbed by the cells produce cellular alterations. Unabsorbed rays are quite inert, so far as any effect on tissue is concerned.

Both roentgen rays and radium rays act on the different tissues of the body in the same general way. Although the changes produced vary in intensity, they are always degenerative in character. There is no basis whatever for the notion that such rays can increase cellular metabolism in the sense that the growth of tumors can thus be increased.[2] Now, the effect of roentgen and radium rays on different tissues of the body varies within wide limits. On the basis of their sensitiveness, tissues and structures may be graded, from the most sensitive to the least sensitive, about in this order: sex glands (testicle and ovary), blood and blood-forming organs (bone-marrow, spleen, and lymph nodes), thymus, skin, mucous membranes, fibrous connective tissue, muscle, bone and nerve.

TREATMENT OF TISSUES AND ORGANS

Sex Glands. The sex glands are very sensitive, even to moderate doses of radiation. In the testicle the rays affect chiefly the spermatogonial cells, influencing the whole process of spermatogenesis. Such effects naturally vary with the dosage, so that any degree of alteration may be produced. However, even with heavy doses, aspermatogenesis is not induced at once, because cells that have already reached an advanced stage of development, from the spermatocytes of the first order to the adult spermatozoa, are not so susceptible as young cells; the alterations produced become discernible only as the spermatogonial cells complete their cycle of evolution. In the ovary the rays act chiefly on the primordial follicles, the sequence of events being much the same as in the testicle. Given a dosage sufficient to destroy all the ovarian follicles, the artificial menopause so induced resembles in every respect the natural menopause, except that it is more rapid.

The action of roentgen rays on the sex glands is occasionally made use of therapeutically. Sterilization may be readily accomplished by means of roentgen rays, when the preservation of internal secretion is not important. However, if it is essential to maintain internal secretion, sterilization by surgical means is preferable. In the hemorrhagic diseases frequently encountered in the female, roentgen rays can again be used to diminish ovarian activity, and in certain cases to control symptoms, but this requires careful adjustment of dosage. Because the ovaries of different women vary so much in functional activity, it is impossible in a given case to be certain of adjusting the dosage so nicely as to bring about the desired control of symptoms without the risk of producing complete cessation of function. Hence, except in the case of uterine fibromyoma, radium is the agent of choice in hemorrhagic diseases of the female sex glands, because its dosage can be more accurately regulated. In such conditions radium must be introduced directly into the uterine cavity, and, in some instances, it is objectionable on this account. Moreover, the availability of radium does not absolve the physician from the responsibility of investigating and dealing with all the possible causes of hemorrhage. Roentgen-ray treatment should be limited to women who have reached, or are approaching, the natural menopause, and who no longer expect or desire children.

Blood and Blood-forming Organs. The action of roentgen and radium rays on the circulating blood consists of a primary leukocytosis, bearing chiefly on the polymorphonuclear cells and lasting from a few hours to two or three days, followed by a steadily increasing leukopenia (due to destruction of lymphocytes), and after a time by more or less complete regeneration of the elements of the blood. Regeneration occurs after large as well as after small doses, but the rate varies according to the dose employed. On the normal spleen and lymph nodes the effect of the rays is limited chiefly to the destruction of lymphocytes, which is not nearly so pronounced as when these structures are in a state of hyperplasia from any cause. Hyperplastic lymphatic aggregations are markedly susceptible to radiation, the lymphocytes being destroyed in large numbers and gradually replaced by connective tissue. Roentgen rays have little influence on erythrocytes except after heavy and repeated exposures. Radium rays exert a similar action on the blood, but it is not so pronounced, apparently because the surface exposed is generally smaller. When equal surfaces are exposed to both, the action of radium is more intense than that of roentgen rays. For instance, when similar areas of the spleen are subjected to radium and to roentgen rays, the destruction of lymphocytes is more pronounced in the case of radium, and subsequently more extensive replacement by connective tissue results.

These effects on the blood-forming organs are made use of in the treatment of certain diseases of the blood, spleen and lymph nodes. In leukemia the great capacity of radiation to destroy lymphocytes and to produce leukopenia is valuable, because the leukocytosis manifested by this disease can thus be greatly reduced. In the myelogenous form the treatment is largely concentrated on the spleen, but if this is not sufficient, the effect can be increased by treatment of the marrow of the long bones. In lymphatic leukemia the treatment is directed to the main groups of lymph nodes affected, whether superficial or deep, and, if necessary, also to the long bones. At first such treatment is remarkably effective, but after it has been repeated a number of times its effectiveness gradually diminishes because of increasing fibrosis; and finally the lymph nodes become quite resistant to the rays.

However, patients with leukemia are often maintained in relatively good condition for several years. Because of the greater intensity of radium rays, and because, no matter how treated, patients with leukemia cannot be permanently cured, it is best to start treatment with roentgen rays of low penetration (low voltage), then gradually to increase their penetration as the leukocytes or lymphoid cells become more resistant to the rays, and finally to use radium, which will still exert definite influence after roentgen rays have exhausted their power. If radium is used at the beginning, its effectiveness will be rapidly exhausted, and the disease cannot be controlled for so long a time. The effect of radiation on the erythrocytes is utilized in the treatment of polycythemia. The rays must be relatively penetrating and the treatment repeated several times before the erythrocytes can be notably reduced.

The use of radiation in the treatment of hypertrophied tonsils and adenoids has been the subject of much controversy. In children and young adults, with tonsils made up largely of hyperplastic lymphoid cells, the tonsils can be readily diminished in size by exposure to roentgen or radium rays, although the rays have no direct effect on abscesses in or near them. In some cases the reduction of the tonsil, brought about by the destruction of the lymphoid cells by the rays, and the consequent shrinkage of the organ, may be sufficient to squeeze out the contents of certain abscesses, but there is no certainty that abscesses will disappear in this way. Hence, when the tonsils are infected, surgical excision is preferable. In adults, diseased tonsils are usually the seat of more or less scarring, and in many cases but little lymphoid tissue is left. Consequently, radiotherapy cannot be expected to have much influence on such nodes.

In cases of simple adenitis the cause should be sought and removed, but hyperplastic lymph nodes can be more rapidly reduced to normal by radiation. In tuberculous adenitis, roentgen-ray treatment is effective, but it must be continued systematically for several months in most cases. The reaction of the nodes is definitely slower when patients have been subjected previously to operation, probably because of scarring. It is generally better to aspirate pus from tuberculous abscesses in such nodes by means of a needle introduced, not through the thin fluctuating portion, but through the more normal surrounding tissue, so as to prevent the formation of sinuses. Then the roentgen-ray treatment may be given systematically. It is well to give children general exposures to ultraviolet rays as well as to roentgen rays.

Thymus. An abnormally large thymus in infants is remarkably susceptible to roentgen rays; a gland covering a large portion of the thoracic field in a roentgenogram can be reduced to normal after one or two exposures. In older children the effect is not nearly so striking.

Skin. The normal skin varies somewhat in its sensitiveness to roentgen and radium rays, such variation amounting to between 10 and 15 per cent, according to the complexion of the individual and according to the part of the body. Thus the skin of a red-haired blond is much more sensitive than that of an absolute brunette, and the skin over flexor surfaces is more sensitive than that over extensor surfaces. On normal skin the effect of the rays may be functional or organic, according to the dosage. The functional effects consist of temporary epilation or inhibition of glandular secretion; the organic effects, of permanent loss of hair and of glandular function. Excessive dosage may lead to atrophy, telangiectasis and destructive changes of an inflammatory nature commonly known as radiodermatitis.

In the treatment of skin diseases, the selection of roentgen or radium rays depends on the nature, size, location and distribution of the lesions. Nevi, small keloids, and other lesions limited in extent and sharply defined are best attacked with radium. Larger and ill-defined lesions and varieties of dermatosis are best treated with roentgen rays. In such conditions the rays exert a specific action on the diseased cells, which, because of their greater sensitiveness, are more vulnerable to the rays than normal cells. In ringworm roentgen rays have no direct action on the parasite, but, by causing a temporary epilation, they remove the habitat and thus give the skin an opportunity to recover.

In hypertrichosis the hair follicles are excessively developed and their functional activity consequently exaggerated. The destruction of such hyperactive follicles requires a roentgenologic dose which would be dangerous to the surrounding normal skin and, consequently, experienced radiologists usually refuse to undertake such treatment. Roentgen rays are useful in the treatment of hyperidrosis, but treatment has to be given cautiously and repeated many times to bring about the desired reduction in functional activity.

The specific action of roentgen rays on the pathologic cells in many skin diseases is constantly made use of. In acne vulgaris roentgen-ray treatment combined with surgical treatment of the skin (drainage of infected areas) shortens the course of the disease considerably. In acne rosacea the results are not so uniformly good; the condition is improved in some cases, whereas in others it is more or less resistant. The subacute and chronic forms of eczema and eczematoid dermatitis generally respond well to roentgen-ray treatment. Improvement occurs in certain cases of lichen planus and not in others. Small keloids are best treated with radium, but roentgen rays are preferable for large ones. The lesions respond very well and the skin can be thinned down to normal, such a result being purely a question of time. Warts and corns can be permanently removed by means of roentgen rays, although some require heavy doses and a few are quite resistant. Actinomycosis and blastomycosis, when superficial, are distinctly amenable to radiotherapy. Lesions deep in the body, however, whether in the intestines or lungs, are generally not affected and the prognosis in such cases is very bad.

Carbuncles and furuncles, if exposed to a suitable dose of roentgen rays during the initial stage, will generally be aborted in their course and the period of drainage and healing correspondingly shortened. Moreover, the pain incident to such lesions is rapidly abolished. Treatment during the later stages, however, is without benefit.

In epithelioma of the skin the basal-cell form must be distinguished from the squamous-cell. In the former, roentgen or radium rays may be employed according to the size and location of the growth, and more than 90 per cent of the cases can be permanently cured. The important factor is the dose, which must be massive; whether given in one sitting or in several at short intervals makes no difference, but "fiddling" with such a lesion with small doses repeated over a long period is both unsound and unwise. In squamous-cell epithelioma, surgical excision combined with preoperative or, at least, postoperative radiation should be employed.

SIGNIFICANCE AND TREATMENT OF RADIODERMATITIS

Radiodermatitis may be acute or chronic. The acute form varies in degree, but like ordinary burns it is generally classified in three degrees. First-degree radiodermatitis, generally known as "erythema," consists, as the name implies, in redness followed by pigmentation and exfoliation. The second-degree reaction goes through the same changes as the first degree but they are accompanied by vesiculation, superficial scarring, dryness, atrophy, and, after many months, telangiectasis. The third degree begins in much the same way, except that its different phases are more severe, and the skin, instead of returning to normal, gradually becomes edematous and finally ulcerates over the exposed areas. Such ulceration resulting from a single exposure to a small area (no previous exposure ever having been made) will generally heal spontaneously within two or three months. However, if the area is large or if an overdose is given after many exposures, healing will be very slow and the ulcerated area very painful.

Radiodermatitis of the first and second degree requires no treatment beyond the application twice a day of Dodd's lotion.* Early third-degree reaction should be treated in the same way, but when ulceration has taken place the problem is an entirely different one. The chief object is to combat infection so as to favor the early formation of epithelium. Old third-degree radiodermatitis, involving soft parts which are flexible and over which the tissues are loose, may require excision and later plastic repair. However, before this is attempted, infection of the field should be carefully reduced by treatment with weak hyclorite solution and by exposure to sunlight.[1]

The expression "x-ray burn" should be restricted to injury of the skin to the third degree. It should not be employed when the reactions are mild, because such reactions are commonly the result of deliberate planning on the part of the radiologist, who, in certain conditions, must give the patient doses of roentgen rays to the limit of skin tolerance. Whenever a physician attributes any condition to x-ray burn, this immediately suggests to the patient a most sinister meaning, and gives the impression that such changes are the result of incompetence or of mistakes in technic. The radiologist is not more prone to error than other members of the profession; hence it behooves us all to avoid throwing stones lest we do an injustice to a fellow practitioner and to the entire profession. Radiodermatitis of the first or of the second degree seldom leads to permanent injury beyond atrophy of the skin and sometimes telangiectasis. When the nature of some of the diseases treated is taken into consideration, slight skin changes are certainly a lesser evil, especially if life is at stake, as in the case of so many tumors. Consequently, the attending physician should never make statements to the patient concerning a tissue disturbance possibly due to roentgen rays or to radium without first consulting the radiologist, whose special knowledge enables him to distinguish between radiodermatitis and other cutaneous manifestations with which it is sometimes confounded.

ANALGESIC EFFECT OF ROENTGEN RAYS

That roentgen rays exert a truly analgesic effect in certain cases is not so well known as it should be, even by radiologists. And yet their pain-relieving qualities cannot be questioned by anyone who has tried them in suitable cases. However, to expect roentgen-ray treatment to stop pain of every description, whatever its cause, is unreasonable and can lead only to disappointment. The pain of early metastatic lesions in bones, such as those occurring in the spine following cancer of the breast, can often be abolished completely or for long periods. This is also true of the pain incident to chronic arthritis and in certain cases of neuralgia.

TREATMENT OF BENIGN AND MALIGNANT NEOPLASMS

It has been pointed out that the more nearly embryonic the cell, the more susceptible it is to radiation, whereas the more adult, differentiated, or specialized the cell, the greater its resistance is. This is generally true; also the cells characterizing various forms of neoplasm behave in exactly the same way. Tumors derived from structures highly susceptible to roentgen and radium rays are themselves very sensitive to them. Tumors not only vary in radiosensitiveness according to the cellular prototypes from which they are derived, but according to the organ in which they originate. The reaction to radiation of certain varieties of tumors is so characteristic as to constitute for the initiated a valuable means of differentiation. Thus malignant embryoma (also known as seminoma), which is the most common variety of testicular neoplasm, is highly susceptible to radiotherapy, both in its primary and secondary manifestations. Tumors of large size melt away in a short time. Indeed, this quick reaction can be made use of to distinguish such tumors from other varieties which are much less sensitive, such as true carcinoma or sarcoma of the testicle, and the relatively benign true teratoma.

In most cases of malignant embryoma the condi-

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* Formula of Dodd's lotion:

Phenol	1.85 gm.
Zinc oxid	15.50 gm.
Glycerin	5.00 gm.
Lime-water (quantum sufficit adde)	250.00 c.c.

After the bottle has been thoroughly shaken, the lotion is poured over a wad of absorbent cotton until the latter begins to drip. This sponge should then be gently dabbed over the inflamed surface, and the lotion allowed to dry. The application should be repeated so that the entire area will be thoroughly covered with the lotion. The second coat should be dry before clothing is put on. This lotion should be applied night and morning for at least two weeks.

tion of the patient can be improved rapidly and to a marked degree; indeed, by proper treatment, such improvement can often be maintained for a prolonged period. Since most ovarian tumors belong to the carcinoma or sarcoma group, their reaction is similar to that of corresponding tumors in the testicle; that is, they are only moderately or slightly sensitive. When radium is used to treat this variety of tumor, the initial response is generally quite striking; but, since, however palpable such tumors may be, we can never be certain of the extent of involvement, roentgen-ray treatment is preferable. Nor is it necessary to employ high-voltage roentgen rays, except in rare cases. In most cases, roentgen rays generated at moderate voltage are sufficient.

Malignant Lymphoma. Lymphosarcoma and Hodgkin's disease, being derived from lymph nodes, are also markedly affected by radiotherapy. Many patients, even in fairly advanced stages, with or without large tumors in the mediastinum or elsewhere, can often be restored to normal for a period varying between several months and several years. The rapidity with which the enlarged nodes diminish in size is also characteristic, and is not approached by any other variety of malignant disease with which it might be confounded. If the disease is to be brought under control or the maximal benefit obtained, it is important that the roentgen-ray treatment be directed, at first, not only to the palpably enlarged groups of nodes, such as occur in the cervical, axillary, and inguinal regions, but also to the mediastinal and retroperitoneal lymphatic chains. Such comparatively general treatment should be repeated at least two or three times, but later it may be limited to those regions in which adenopathy persists. In certain cases the enlargement of the nodes in one region may be so great as to produce pressure symptoms which should be relieved as quickly as possible, when the greater superficial action of radium can sometimes be brought to bear with good effect. The painless insidiousness of the disease makes it vital to impress on the patient the necessity for periodic examination, including a roentgenologic inspection of the thorax.

Uterine Fibromyoma. The commonly beneficial effect of radiotherapy in cases of uterine fibromyoma is due partly to the influence of the rays on the ovaries and partly to a direct action on the cells of the tumors themselves. Since such treatment involves the production of artificial menopause through destruction of the functional activity of the ovary, it should be restricted to women who are approaching the natural menopause and who present no urgent symptoms, such as excessive bleeding. If the tumor extends above the umbilicus, if the patient is still young enough and anxious to have children, if there is evidence of calcification in the tumor, if there is pelvic infection, or if the bleeding is excessive and demands immediate control, operative treatment should by all means be considered. If it is certain that the tumor or tumors are located immediately beneath the mucous lining of the uterus, radium introduced into the uterine cavity is quite effective; but since it is impossible in most cases to be certain of the uterine plane in which the tumors are located and since in so many cases there are multiple tumors, roentgen-ray treatment is generally more effective than radium. With high-voltage roentgen rays one course of treatment, consisting of a two-thirds or three-quarter dose to one anterior and one posterior field, is sufficient.

Endothelioma. This variety of neoplasm is relatively susceptible to radiotherapy and the primary lesion generally responds well.

Giant-cell Tumor. Giant-cell tumor is also satisfactorily treated by radiation. From two to six weeks after a heavy dose of roentgen rays, the tumor undergoes a reaction accompanied by swelling which may give the impression that the tumor is growing more rapidly. This, however, is only a temporary phase of the reaction. A little later the swelling subsides, the tumor itself gradually disappears and bony regeneration takes place.

Carcinoma. The sensitiveness of carcinoma depends on the organ in which it is situated. This variety of tumor is always much less sensitive than growths, such as lymphosarcoma or testicular tumors; yet many such tumors can be greatly influenced and kept under partial or complete control for a certain length of time. Carcinoma of the thyroid gland is the most sensitive variety of carcinoma, and patients often do very well following thorough radiotherapy.

In cases of carcinoma of the uterus, it is necessary to distinguish between carcinoma of the cervix and carcinoma of the fundus. In the former radiotherapy is the method of choice, whereas in the latter surgical intervention is to be preferred, whenever the condition is operable, radiation being reserved as a means of palliation for disease too extensive to permit total surgical eradication. Carcinoma of the cervix is, next to carcinoma of the thyroid gland, the most radiosensitive variety of carcinoma. Here the results of sound radiotherapy are superior to those obtained surgically, and an increasing number of surgeons refuse to intervene in this condition. The treatment involves the introduction of radium into the cervical canal, its application to the cervix, and also radiation to the parametria. Since the maximal effect of radium is limited to a comparatively narrow zone, an effort is also made by means of high-voltage roentgen radiation from the outside to increase the total dosage sufficiently to influence the lymphatic drainage of the uterus.

In cases of carcinoma of the breast, radiotherapy cannot replace surgical excision of the primary growth and its tributary lymphatics whenever this is feasible. However, radiation tends to improve the end-results either by preventing recurrence or delaying it. Even when recurrence or metastasis occurs, radiotherapy is often useful in checking superficial ulceration, in diminishing the rate of growth of the malignant foci and in relieving pain. Radiotherapy before and after surgical amputation should be carried out by means of roentgen rays, because it is essential to irradiate a large territory as uniformly as possible. The old practice of repeating such treatment once a month for a long time after operation has been discarded, because if the dose is adequate, from one to three courses should be sufficient; if the dose is not adequate, indefinite repetition would be useless.

In dealing with cases of inoperable carcinoma of the breast the problem can be attacked in one of two ways. The treatment may be limited to roentgen rays alone, or radium and roentgen rays may be combined. The latter alternative should be reserved for cases in which it is possible to implant radium units throughout the primary growth, the roentgen-ray treatment serving to supplement the effect of the radium by additional radiation from the outside.

At short range radium has a more intense action than roentgen rays, and this advantage is sometimes useful. For example, when repeated roentgen-ray treatment no longer influences superficial carcinomatous nodules, radium may still exert an inhibitory influence. Seldom is the reverse true. This advantage can often be utilized in superficial recurrence of carcinoma or of other forms of malignant disease. Radium may be employed with at least temporary success after the effectiveness of roentgen rays has become neutralized by the increasing tolerance of the malignant cells. However, since radium itself can seldom arrest the activity of malignant cells permanently, it should be reserved until the power of roentgen rays has been completely expended. Control of malignant deposits can thus be maintained for a longer period. This does not apply to solitary foci which can be permanently overwhelmed by a massive attack with radium.

Sarcoma. The reaction of sarcoma is dependent on the rule that the more cellular the tumor the more sensitive it is to roentgen rays; therefore, the round-cell variety is the most sensitive and the osteosarcoma, the most resistant. However, as a highly cellular neoplasm is more active and metastasizes earlier than one less cellular, it is common to see a splendid primary result defeated by metastasis to the lungs or elsewhere.

Although radiotherapy generally leads to but partial and temporary regression of sarcoma, in some cases regression is complete and of long duration. It is unfortunate that there is no certain means of estimating the probable response of a given tumor, but after it has been treated once or twice it is usually possible to foretell its subsequent course fairly accurately.

CONCLUSIONS

Radiotherapy is useful in the treatment of many diseases, in some of which it is actually the method of choice. In connection with malignant neoplasms it is unfortunate that only a minority of patients are permanently cured by surgery, by radiotherapy, or by any other method. This fact, however, does not prevent such methods from being most helpful to many patients. No one thinks of condemning surgery because the majority of malignant tumors operated on nevertheless prove fatal sooner or later; it is realized that the results of such treatment are sufficiently good in most cases to be worth while, if only for the temporary relief afforded. The same is true of radiotherapy, which, like surgery, is sufficiently useful to deserve an important place in the treatment of many varieties of neoplasm. Indeed, if the ability to cure many diseases permanently were to become the criterion by which the value of any method of treatment is to be determined, much of our vaunted modern therapeutics would have to be abandoned.

Finally, I wish to emphasize the point that adequate radiotherapy requires not only a knowledge of the technical phases of radiology, and of general and special pathology, but also a thorough understanding of their relationship. Such knowledge demands special preparation and cannot be acquired by the mere purchase of a roentgen-ray machine or a bit of radium.

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DIAGNOSIS OF GALLBLADDER DISEASE*

A STUDY OF 100 UNSELECTED CASES

MALCOLM D. WINTER, M.D.
MILES CITY, MONT.

Much has been written concerning the diagnosis of gallbladder disease, yet in my own practice, at least, there is possibly a greater element of uncertainty in its diagnosis than in most other gastro-intestinal diseases. Where we have the classical case with biliary colic, radiation of the pain to the shoulder blade and perhaps jaundice, the diagnosis is usually easy and the treatment clear. The trouble, as is usual in the field of diagnosis, is in the atypical case. This element of uncertainty has furnished the impetus for a large amount of experimental work by others and serves as the excuse for this paper.

FUNCTION OF THE GALLBLADDER

For many years the gallbladder has been considered as a simple storage reservoir. Here the bile was thought to be stored during the nondigestive phase for use during the digestive period. Mann[1] has recently called attention to the discrepancies of this theory, namely that the capacity of the gallbladder in dogs and probably also in man is only sufficient for the amount of bile secreted by the liver at its normal rate in about half an hour. The same author by experimental obstruction of the common duct in dogs has shown that jaundice normally develops in thirty-six to forty-eight hours, while if the gallbladder is removed at the time of the obstruction, it occurs in twenty-four hours or less. This is also true, if the gallbladder is diseased. This evidence, together with the known fact that gallbladder bile is from seven to ten times more concentrated than liver bile, would seem to prove that the gallbladder does concentrate bile.

The question, then, arises as to whether this function is a protective one for use when the common duct is obstructed, or is for the purpose of furnishing concentrated bile for a specific purpose. It has been shown that ingestion of certain food causes the gallbladder to contract, emptying its contents into the duodenum, and that reabsorption of bile causes greater secretory activity of the liver. It, therefore, seems plausible that the concentrated bile may be used for this purpose.

In this connection the work of Whitaker,[2] based on preliminary work by Boyden, is interesting. He finds that ingestion of a meal rich in fat causes a rapid reduction in the size of the x-ray shadow of the gallbladder, after sodiumtetroidophenolphthalein has been given. This, he states, is even more marked than after magnesium sulphate intraduodenally.

Judd[3] has emphasized the changes taking place in the bile ducts after cholecystectomy, namely the relaxation of the sphincter of Oddi and dilatation of the common duct, with consequent fall of the intraduct pressure to practically zero. This suggests that the gallbladder may act as a pressure bulb, maintaining the normal bile pressure within the ducts.

When the functions of the gallbladder have been more thoroughly worked out and understood, no doubt we shall be able to diagnose and treat more intelligently the functional as well as the pathologic disorders, to which it is susceptible, even as we do kidney disease at times before grave anatomic change has occurred.

ETIOLOGY OF GALLBLADDER DISEASE

Primary cholecystitis, acute or chronic, must certainly be due to infection. Those of us who have been through the influenza epidemic will no doubt remember of seeing many cases of acute primary cholecystitis as an aftermath of that disease. Formerly we felt that the majority of cases were of infectious origin, either by way of the lymphatics or from foci by way of the blood stream. Now we realize that cholecystitis, secondary to or associated with gallstones, may be due to a precipitation of cholesterol, due to a cholesterosis with inflammation of the gallbladder as a result of stone formation rather than caused by it.

In this series of 100 cases, picked at random from our history files over the past two years, pregnancy was the most frequent predisposing cause. There were 70 women and 30 men. Of the women 64 had had one and usually more pregnancies, and 20 dated their symptoms from a pregnancy. Of the six women who had not borne children two had had typhoid fever. Dr. R. R. Randall,[4] an obstetrician, for our group has noted that women who have vomiting of pregnancy which is not controlled by ordinary measures, such as corpus luteum, sedatives, etc., often later develop frank gallbladder disease.

The average weight of the women was 156⅛ pounds and of the men 158½ pounds. The most obese in this series weighed 225 pounds, the least, a woman, weighing 90 pounds.

The ages were as follows: 13, 1; 19, 1; 20-25, 2;

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* Read before the Forty-eighth Annual Meeting of Medical Association of Montana, Billings, Mont., July 16-17, 1926.

25-30, 8; 30-35, 15; 35-40, 18; 40-45, 16; 45-50, 12; 50-55, 6; 55-60, 13; 60-65, 4; 65-70, 4.

You will note that almost a third of these patients are less than thirty-five years of age. Cholecystitis occurs more frequently in the young than is generally recognized. Stones frequently are present in this group, although cholecystitis without stones is more common. Curiously our youngest patient, aged thirteen, was the daughter of another patient of this series. Both had stones and their operations were less than a year apart.

Eleven patients gave a history of typhoid fever. Six cases dated the onset of symptoms from an attack of influenza.

SYMPTOMATOLOGY

Colicky pain at the right costal margin or in the epigastrium with radiation to the shoulder blade, usually the right, is the most frequent and trustworthy symptom. Judd[5] has recently called attention to the fact that it is in this type of patient that surgery gives its best results. Radiation of the pain often occurs in the back, nipple and in several of our cases to the precordia, suggesting angina pectoris, from which it must be differentiated. Residual tenderness over the gallbladder after an attack is often a very helpful symptom. Thirty-nine of our cases stated that they were made worse by fatty foods, while nine were made worse by acid food.

In the remaining fifty-two no note was made of food tolerance, except to state that overeating usually caused trouble. Six cases complained of symptoms commonly associated with peptic ulcer, namely distress two or three hours p. c. with food ease. Yet on x-ray examination only one showed an ulcer. Neither was ulcer discovered at the time of operation, except in this one case. We have been accustomed to classifying these cases as gallbladder disease with the ulcer syndrome.

Eusterman[6] has given a very excellent classification of the clinical types of gallbladder disease. It is as follows: (1) The latent type, characterized by distress after excessive eating. (2) The pleurisy type, with chest pain as the dominant feature. (3) The typical or colic type. (4) The ulcer type. (5) The chronic indigestion type. (6) The crisis type. (7) The left sided type.

Indigestion, bloating and belching without definite colic often occur, and here our experience coincides with that of Judd in that this type of patient is less liable to get complete relief of symptoms from surgery, even though at operation there is definite pathology of the gallbladder.

One case recently operated on has an attack of giant urticaria a few hours before each colic. Osler mentions two such cases. Since operation our patient has had no further attacks. Another case, whose chief complaint was a typical migraine, and who was operated on largely on the basis of a positive biliary drainage, has had no trouble since. Still another complained chiefly of palpitation of the heart and, following the removal of a pathologic bladder, left the hospital much improved. These cases serve to illustrate the bizarre symptoms one may meet in the diagnosis of gallbladder disease.

Practically all of our patients had at least slight tenderness over the gallbladder. It is my opinion that absolute lack of tenderness on careful examination is rather against disease of that organ. In the acute cases the tenderness is, of course, exquisite, and is usually associated with rigidity of the right upper rectus muscle. Frequently the distended gallbladder can be felt or the enlarged liver palpated. Slight glycosuria occasionally occurs and slight traces of bile are frequent during an attack, even without definite jaundice. Urobilinogen in the urine may also furnish a helpful lead, but is not very trustworthy.

In this series there were 25 with achylia, 29 with hypoacidity, 28 with moderate hyperacidity and 18 with normal acid curves.

THE PRESENT STATUS OF BILIARY DRAINAGE

No discussion of the diagnosis of gallbladder disease on the part of an internist would be complete without consideration of biliary drainage. In a recent summary Lyons[7] states that, out of 376 cases, 318 were treated by nonsurgical methods alone, in which duodenal drainage was featured. Some patients had incipient disease, some late pathologic lesions and many were seriously ill. Thirty-five per cent remained symptom-free for from one to four years, and objective findings were normal. Fifty-two per cent were so much cured that they were able to resume former occupation and discard further active treatment for periods longer than one year. Nine per cent in a group of chronically ill patients were considerable improved; 2 per cent were unimproved, and one patient died. Lyons believes that surgery should be confined to the removal of pathologic conditions, such as gallstones, adhesions, stricture, cancer, etc. This represents the attitude of many men who are extremely enthusiastic over their results. On the other hand, Rowntree[8] says that at the Mayo clinic they have been disappointed in their results and have largely given up doing biliary drainage.

Brown[9] reported 200 observations on 125 patients, in which drainage was done for diagnostic purposes. It is here that this procedure has found its greatest usefulness in our hands.

In this series there were 57 on which drainage was done. In the rest the history and physical findings were so definite that it was not considered necessary. Of these 57 there were 34 proved at operation, and the findings at the time of operation and their subsequent histories have fully justified the diagnosis.

In our experience a dark, cloudy gallbladder bile with flakes of mucus, which on microscopic examination shows an increased number of leucocytes, is the most common finding, when the gallbladder is diseased. In the more acute cases the leucocytes are more numerous, and at times gallbladder bile seems loaded with pus, while in the more chronic cases, especially when stones are present without recent colic, there are many flakes of mucus, with only an occasional pus-cell. Inability to get gallbladder bile, when the tube has properly passed the duodenum, has usually meant obstruction of the cystic duct, most always from stones. Of course, when the common duct is obstructed, no bile is obtained.

We feel that biliary drainage is a very valuable aid in the diagnosis of gallbladder disease. This is especially true in the atypical case. When a surgeon on opening the abdomen finds a fairly normal looking gallbladder, it is often a very perplexing question as to the advisability of doing a cholecystectomy. A positive biliary drainage in such a case may often be the deciding factor. We find the fractional acid cure, which is obtained as the tube passes through the stomach, also very helpful in diagnosis.

Biliary drainage like all other clinical tests is not infallible. It is our practice to fit it in with other findings, using it as a link in the chain of evidence that must be built up before a diagnosis can be arrived at.

Great advances have been made in the past two years in the x-ray diagnosis of gallbladder disease. We have used both the sodium salt of tetrobromphenolphthalein intravenously, as originally suggested by Graham and Cole,[10] and are at present using the tetroiodophenolphthalein, giving our patients a meal rich in fat, as soon as a good shadow has been obtained, and observing for changes in size and shape of the gallbladder, as well as for evidence of stones, as suggested by Whitaker. We feel this test gives great promise of usefulness, and some workers have reported a correct diagnosis from its use in 95 per cent of cases.

In this series 69 cases were operated upon, and 31 were treated medically. Of the 31 treated medically some refused operation, and some were advised against it on account of their general condition. The cases treated surgically were operated on by Dr. J. H. Garberson. Of these 49 had gallstones and 20 had cholecystitis without stones. One case died from an acute hepatic insufficiency after operation. One case had a carcinoma of the gallbladder associated with his stones and died some time afterwards from recurrence of the cancer. In this series stone in the common duct was encountered only once.

In conclusion, we would say that best results are obtained in the treatment of gallbladder disease, only by close cooperation on the part of the internist and the surgeon both preoperatively and after the operation has been performed.

SUMMARY

1. The various theories of gallbladder function are discussed.

2. One hundred unselected cases of gallbladder disease are reported.

3. Gallbladder disease is more common in the young than is commonly recognized. Twenty-seven of the reported cases were under thirty-five years of age.

4. Pregnancy was the most frequent predisposing cause. Eleven had had typhoid fever; six dated onset of symptoms from influenza.

5. The clinical types of gallbladder disease are discussed.

6. Biliary drainage is discussed and 57 cases, of which 34 were proved at operation, are reported.

(Acknowledgment is here made to Miss Flora McDonald, R.N., for technical assistance in this study.)

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CHOLECYSTOGRAPHY*

Joseph Aspray, M.D.
SPOKANE, WASH.

Cholecystography is a method of radiographing the gallbladder after filling with a phenolphthalein dye which is given to the patient intravenously or orally. The diagnostic value of this method places it as the most outstanding development in the radiographic field in the past four or five years. Graham, Cole and Gopher of the Department of Radiology and Surgery, Washington University School of Medicine and Barnes Hospital at St. Louis, gave their preliminary report on the discovery and development of cholecystography in February, 1924.

Cholecystography is made possible by the excretion or secretion by the liver of the halogen compounds of the phenolphthalein, the so-called "dyes." The drug first recommended by Graham, Cole and Gopher was sodium tetrabromphenolphthalein. This was used intravenously. The method was not generally adopted because of the frequent very severe reactions and shock. The disadvantages of this method, as stated by Carmen in *Radiology* of August, 1925, are as follows: exacting technic; phlebitis, if injected into small vein as median cephalic; local necrosis and sloughing of tissues, if injected into them; pain and discomfort of patient; and the reactions may be so severe that the method is contraindicated in cases, where there is obstruction of the common duct, extensive hepatic damage, marked diabetes, hyperthyroidism, arteriosclerosis, hypertension, and cardiac disease, especially that attended by auricular fibrillation.

After using the bromine drug and getting very severe reactions and shock, Whittaker of Peter Bent Brigham Hospital began the use of sodium tetraiodophenolphthalein orally and intravenously without severe reactions. He found this drug better and less toxic than the bromine drug. The reason for this is that it can be given in smaller doses, one-half of the amount required of the bromine drug being sufficient. This drug was successfully used in patients with jaundice, cirrhosis of liver, hemachromatosis, chronic passive congestion, nephritis, hypertension, chronic myocarditis, angina pectoris and brain tumors.

Investigation of other substances is in progress and some more desirable compound may be found. Drake of the Research Department of the Mallinckrodt Chemical Works, St. Louis, has prepared a large number of substances, many of which have been tried out, and ten of which have the power of making the gallbladder visible. So far, the sodium tetraiodophenolphthalein has proven to be superior to any of the others.

Several methods of administering the drug have been tried. The two methods most generally used are the oral and the intravenous. The oral method was made possible by the discovery of a compound that can be used orally. This method is much easier to use than the intravenous, there is less reaction, and it can be easily repeated. It may cause some nausea, vomiting and diarrhea, but nothing that is serious. It can more conveniently be used as an office procedure. The resulting gallbladder shadows are practically identical with both methods, with a little in favor of the intravenous. Some laboratories use one method and some the other. Opinion seems to be divided. At the Mayo Clinic Carmen and Moore have examined 1800 cases, most by the oral method and state that they prefer this method, checking any obscure cases by the intravenous method.

The oral method is supposed to be about 80 per cent correct in diagnosis and the other about 93 per cent. However, some of the reports give a much closer percentage. In the article already mentioned by Sossman, Whittaker and Edson, a report on 243 cases by oral and 120 cases by intravenous is given. They report correct, operatively proven diagnosis in 93.5 per cent of the intravenous cases, and 95.2 per cent of the oral as against 79.7 per cent by other clinical methods of diagnosis.

Whittaker found the intravenous method to give severe reaction with nausea, vomiting and headache in 8 per cent of 60 cases. Thirteen cases of no shadow by oral method were given the drug intravenously and in eleven of these the findings were confirmed. Whittaker himself had the intravenous method with the bromine drug, later with the iodine drug and also the oral administration of the iodine drug; and he says personally he prefers the iodine drug, oral method.

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* Read before Spokane County Medical Society, Spokane, Wash., April 22, 1926.

Now we will describe the process of cholecystography. The dye is introduced into the system by one method or the other and should reach the liver in a certain time, which time varies according to the method used. In using the oral method, if the capsules are retained one hour, enough dye will go through to give a satisfactory shadow. It takes about twelve hours for the dye to reach the region of the hepatic flexure and presence of the drug in that region on a film is a reliable index. If there is no dye in this region, we need not be surprised if none has reached the liver. We have found, however, that even cases that have had vomiting or diarrhea usually have enough dye to give satisfactory results.

The substance reaches the liver and is excreted, and is concentrated in the gallbladder. Rous and McMaster showed in 1921 that the gallbladder has a concentrating power. The bile in the gallbladder was found to contain eight times the amount of solids that the bile in the ducts contain. Therefore, the drug is concentrated in the gallbladder, making it opaque and causing a shadow on the x-ray film when it is exposed. Naturally no shadow appears, if the liver is unable to excrete the dye in sufficient quantities, if the duct is occluded or if the function of the gallbladder in concentrating is impaired. It has been found that the gallbladder empties during digestion. Films taken after the patient has eaten will show a gallbladder much smaller in size, about 50 per cent of that on first films. If the gallbladder shadow is of standard density, regular in outline, homogeneous, and decreases in size after the patient eats fat or protein food, we may call it a normal gallbladder. The emptying time varies within certain normal limits and according to the method used.

The pathologic gallbladder does not fill or does not fill completely. The density may be reduced because of inability to concentrate. The outline may be irregular and abnormal; the size may be increased. It is always necessary to be sure there is enough dye in the region of the hepatic flexure to give a test.

One of the interesting discoveries due to cholecystography is the unexpected positions of the gallbladders in different people. We have found that the position varies and others report the same thing. We find it anywhere in right side of abdomen, sometimes even below the crest of the ilium. To know the position of the gallbladder is a distinct aid in differential diagnosis.

Thus cholecystography has become a safe clinical procedure of unquestioned effectiveness in the diagnosis of abnormalities of the biliary tract, even in such mild cases of cholecystitis that an accurate diagnosis by other means would be impossible. Its value is not only in ability to recognize gross pathology of the biliary tract but also in the fact that it serves as a functional test, as I have explained above.

Our routine for the use of the sodium tetraiodophenolphthalein orally is as follows: The patient takes the capsules the evening before the x-rays are to be taken. Twelve hours later he reports for first series of films; again at fourteen hours; then he eats some fat or protein food and returns two and a half hours later. If the gallbladder has not emptied he returns again and perhaps another time.

Out of 50 consecutive cases done at my office, 43 did not vomit. Seven cases vomited but none of them severely. Two of these had diarrhea and were reexamined satisfactorily. Of these 50 cases, 37 had no bowel movements, 5 had slight bowel disturbance, 6 had slight diarrhea and 2 had diarrhea. However, there was enough dye in 45 cases for a satisfactory examination and 5 were reexamined, one of them twice, and all were finally satisfactory.

Out of a series of 104 consecutive cases done at my office and at Sacred Heart Hospital, 44 per cent were reported normal gallbladders. Of these normal cases 17 per cent were operated on for abdominal trouble and in all but one case the gallbladder was found to be normal as reported.

Out of the 104 cases 56 per cent were reported pathologic. Of these 26 per cent were operated on and all but one were definitely pathologic. One case was reported pathologic and when operated on it was found there was no gallbladder.

In concluding, we wish to emphasize that cholecystography is a definite standardized procedure to aid in determining pathology and functional abnormalities of the gallbladder. A study of the radiographs shows definite conditions and correct interpretation requires experience and judgment which comes from the study of a large number of cholecystograms.

Mistakes in diagnosis are not due to the method but to wrong interpretations. This applies to some of our own early work. There are cases which we would now, after our experience in 150 cases, interpret differently.

330 Old National Bank Building.

SURGERY OF THE GALLBLADDER*

S. L. Caldbick, M.D.
EVERETT, WASH.

In considering surgery of the gallbladder it is interesting to note that in 1868, twenty-two years after the introduction of ether anesthesia, John S. Bobbs of Indianapolis performed for the first time a cholecystostomy for gallstones.

In 1882, Langenbeck,[1] a German professor of surgery, was the first to do a cholecystectomy. Since then the technic of biliary surgery has been perfected by such men as Courvoisier, Mayo Robson, Kocher and the Mayos.

In 1919, Lyon,[2, 3, 4] of Philadelphia, came forward with a method for the nonsurgical drainage of the gallbladder by means of the duodenal tube and the injection of magnesium sulphate directly into the duodenum. Thus the treatment of gallbladder conditions was to some extent placed on a medical basis. This procedure was certainly a step in advance of the older methods of medical treatment, but as it has not given the results expected, the pendulum has gradually swung back until at present the treatment of pathologic conditions of the gallbladder is preeminently surgical.

The close association of the several organs in the upper right quadrant of the abdomen must be taken into consideration when making a diagnosis of gallbladder disease. Differential diagnosis between the diseases of the duodenum, stomach, liver, common duct, pancreas, right kidney and sometimes the appendix is often very difficult because of the close relationship of the blood and lymphatic supply of these organs. It is plausible to believe that, if any one of these organs becomes diseased, we may find associated disease in the gallbladder.

In the diagnosis of the various pathologic conditions of the gallbladder, a carefully obtained, detailed history followed by a complete physical examination takes first place. This is especially true of the patients who come in complaining of "chronic indigestion or dyspepsia." The routine laboratory work, followed by gastric analysis and fluoroscopic examination, helps to eliminate such confusing conditions as peptic ulcer, carcinoma of stomach, gastric syphilis and benign neoplasms of the stomach. The usual history of accumulation of gas in the upper abdomen with belching and the regurgitation of sour material, the inability to eat such things as raw apples, cabbage and greasy foods and the history of spells of soreness in the epigastric region with or without periodic attacks of colic are all strongly suggestive of gallbladder disease.

During physical examination the following position is most excellent and is an aid in eliciting tenderness in the gallbladder region: Have the patient sit sidewise on the examining table, bent forward with arms relaxed. The examiner brings his arms around the patient from behind and applies pressure over the relaxed abdomen just below the costal arches. Deep pressure with the patient in this position will frequently bring out a tenderness which is not elicited with him in a prone position.

At present we have many reliable aids in the diagnosis of gallbladder disease. For years it has been known that a plain x-ray plate of the gallbladder region would demonstrate stones in about 10 per cent of the cases. In 1924, Graham and Cole,[5, 6] of St. Louis, reported a method for the x-ray visualization of the gallbladder by injecting into the blood stream a dye which is the bromine or iodine substitution product of phenolphthalein. This dye is excreted by the liver and, as it accumulates in the gallbladder with the bile, a roentgenogram is taken. The dye is opaque to the x-rays, so by this means an accurate demonstration of the size, shape and position of a normal gallbladder can be made.

At present the iodine derivative of phenolphthalein is used as it is less toxic than the bromine derivative.[7] The oral method of administering the dye admits the use of this important method without danger or discomfort to the patient. The patient is given five one-gram capsules containing the sodium salt of tetraiodophenolphthalein, and he is instructed to take these capsules during the course of the evening meal and to report to the x-ray department the following morning for roentgen study of the gallbladder. Radiograms are taken at the end of 12, 18 and 24 hours. A diagnosis is made from these plates.

Lange,[8] the professor of radiology in the University of Cincinnati, reports the use of the oral method (*J. A. M. A.*, Dec., 1925) in 500 cases, and in 90 per cent of the normal cases a distinct gallbladder outline was obtained. In diseased conditions the dye does not reach the gallbladder and so no outline is obtained. To be sure that there has not been faulty absorption of the dye in the gastrointestinal tract, the oral method should be checked up by the intravenous injection of the dye, if the gallbladder is not visualized by the oral method. If by the intravenous method it is still not visualized, we have positive evidence that we are dealing with a diseased gallbladder.

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Cholecystography by the Graham-Cole technic will pick up in a remarkable way evident gallbladder pathology, such as calculi and long standing cases of chronic cholecystitis or malignant diseases of the biliary system, but the early cases are apt to be missed by this method. This should be born in mind, for unless we do, it is apt to divert our attention from the real seat of trouble in cases of beginning gallbladder pathology which manifests itself by vague and indefinite symptoms of dyspepsia. In these cases we have to rely on clinical symptoms and a complete physical examination.

It is said that in every case of cholecystitis there is also an associated hepatitis and pancreatitis. At times this involvement may be so slight as to defy clinical diagnosis, but in others it may be so great that the liver may show profound pathologic changes. For this reason it is quite important that we should make use of the practical functional tests for determining the degree of hepatic insufficiency.

For this purpose Van den Bergh[9] has devised practical laboratory methods for determining the amount of bilirubin in the blood serum. In normal blood serum only traces of bilirubin are present. In certain diseased conditions of the bile tracts and the liver and also in certain extrinsic conditions, large amounts of bilirubin occur in the blood serum. In gallbladder disease the chief value of this test is in the differentiation of obstructive and nonobstructive jaundice.

Another method has been devised by which we inject a dye and at the end of a given length of time determine the amount of the dye in the circulating blood.[10, 11] In the normal individual the phenoltetrachlorophthalein test for liver function shows no dye in the blood serum at the end of thirty minutes. In pathologic conditions the liver may be so diseased that none of the dye is excreted and so all of this is found in the blood at the end of thirty minutes. This test has comparatively little value as an aid in gallbladder diagnosis except in differentiating late cases from primary or secondary malignancy of the liver and cirrhosis. It is just as important to determine by these practical laboratory methods the relative amount of hepatic insufficiency as it is to determine the amount of renal insufficiency in certain cases by employing similar methods.

For convenience, patients suffering from gallbladder disease may be divided into two groups: The first group embraces those who have suffered a single attack without a recurrence and in whom the gallbladder disease is discovered accidentally during laparotomy for some other condition. The second group embraces those who have had repeated attacks of trouble. The first group may be called latent; the second group may be called active. In the latent class surgery is not recommended. When latent gallbladder disease is accidentally discovered during laparotomy for some other condition, it is usually better to complete the intended operation, make a record of the gallbladder pathology and deal with it at a subsequent date.

In the second class operation is indicated. We explain to the patient the possibility of suppuration, perforation and gangrene incident to delaying operation. The public is aware of the danger of acute appendicitis but is rather ignorant of the danger of acute gallbladder disease. By education they are beginning to realize, however, the danger of permitting recurrent attacks of this disease to take place.

The pain in cholecystitis is an expression of inflammation or is due to colic caused by stones. We find varying degrees of inflammation in the diseased gallbladder, such as acute and chronic enlargements, exudate or infiltration with fibrous adhesions to neighboring organs. With each repeated attack, there is another change added to the already altered structure of the gallbladder. This change may be further thickening of the gallbladder walls, further adhesions, or even suppuration, ulceration, gangrene, perforation or cicatricial contraction. I believe perforation is more frequent than is generally supposed. In my limited experience I have operated upon four cases of perforation of the gallbladder. Simple drainage was done and all four patients fortunately survived. Two of these underwent a cholecystectomy later and the other two have passed from my observation.

The pathogenesis of gallbladder disease may be as follows: First, infection of the liver, which causes irritation in the bile ducts and stasis of the infected bile, then extension of the infection through the gallbladder and pancreas, thus establishing a "vicious circle." As yet the liver and pancreas are fairly safe from the reach of the surgeon. The lowly gallbladder may be removed without harm, and its removal from the circle of pathology as described above is beneficial in breaking up this "vicious circle" of infection.

We have studied two diabetic cases in the past few months that have seemed particularly significant to us. They have shown us that the danger of surgery performed upon diabetic patients is not as great as it was a few years ago. Not only did these patients withstand the surgery well, but the diabetes was improved to an astonishing degree.

The patient's condition permitting, I prefer ether as the most satisfactory anesthesia. In critical cases local anesthesia or local and gas may be elected. I have used these to a certain extent but have not had entirely satisfactory results. With general ether anesthesia greater relaxation can be obtained, greater speed of operation is possible, and less trauma to tissues occurs. Consequently less shock is experienced by the patient. These facts make ether far superior to any other form of anesthesia, at least in my hands.

In gallbladder surgery it is imperative that the operator develop a good technic. After the common duct has been demonstrated both to the satisfaction of the operator and his assistant, it is usually not difficult to place the left index finger to the left and behind the cystic duct, and with a slight twisting motion the forceps meet the gloved fingers. Then the left index finger should be pressed against the hepatic ducts and the forceps gently opened. The left index finger should be kept in place so that no injury will come to the ducts. At this time the common duct should again be observed by the operator and demonstrated to his assistant. Gallbladder clamps may then be applied. In so doing the clamps should be applied transversely to the long axis of the liver, so that the ends of the forceps jaws can be plainly seen. Do not clamp the duct until you can plainly see what you are doing because great damage may be done to the ducts and vessels. With the clamp in place on the cystic duct a ligature of a half length of No. 2 chromic gut, silk or linen, is passed behind the duct alongside the forceps. A square knot is made outside the abdomen and carefully tightened until, after being placed below the clamp, it is tied. The ligature should be tied tightly. As the clamp is gently released, a second ligature should be placed in the same manner on the clamped portion of the duct. When the clamp has been removed the cystic duct may be ligated with the cystic artery or separately.

If the gallbladder is not too badly diseased, it can be grasped with a smooth forceps and put on a stretch. Then with a sharf knife the serous coat of the gallbladder is severed about one-quarter to one-half inch from the liver margin, extending from the cystic duct to the fundus. The same is done on the opposite side of the gallbladder. A second clamp is applied just above the one already on the duct. Then with a small knife the duct is severed and the stump cauterized. The gallbladder is dissected from its bed in the liver. This can be done, if one is careful, with a sharp knife. Blunt scissors may be used or a piece of gauze over the finger. Then dissection is carried to within one-half inch of the fundus. The gallbladder is now wrapped in gauze and gentle traction is made while the stump is cauterized. The peritoneum is then sewed over the gallbladder bed.

Should the pathologic changes be so great that this simple procedure is not permissible, we have found it convenient after freeing the gallbladder to grasp the fundus with a plain forceps held in the left hand, making gentle traction to the left. With a sharp knife, the serous coat on the right side of the gallbladder is incised about one-quarter to one-half inch from the liver margin. This incision may be carried across the neck of the gallbladder, making a triangular flap. A careful dissection is made, rolling the gallbladder out of its bed to the left, and in this manner a good exposure of the vessels and ducts can be obtained. After ligation in the usual manner, the opposite serous coat is cut away and the gallbladder is removed. Then with No. 00 plain gut on a small round needle, the serous coat on the right side is pierced with the needle which is then passed through the triangular flap previously dissected from the neck of the gallbladder; then the needle is passed through the serous coat on the left side and the suture is tied. A continuous suture is then made. We have found this procedure if carefully done will make a perfect peritoneal toilet.

Another method of removing the gallbladder, but one which I have not used, is by making an incision in the right free border of the gastrohepatic omentum, and with careful dissection the ducts and blood vessels are revealed. The vessels are ligated separately and the gallbladder is removed from below upward.

Much discussion has arisen regarding cholecystectomy versus cholecystostomy. This I believe has been carried far beyond all reason. It seems to me that the lines are clearly drawn. As a general rule, cholecystectomy should be performed unless the indications to do *not* more than simple drainage are quite definite. The chief indications for cholecystostomy are suppurative or gangrenous types of cholecystitis, particularly where the acute inflammation involves the small biliary passages, producing an acutely engorged and inflamed liver. In these cases the patient is acutely ill and time is a vital factor. The essential need is that of free drainage for all of the biliary passages. In these cases a secondary cholecystectomy is usually required later. Another contraindication to removal of the gallbladder is malignancy, involving the biliary tracts or including the common duct as in cancer of the head of the pancreas. In such an instance the gallbladder may be needed for an anastomosis to the duodenum.

Drainage after cholecystectomy is entirely a matter of judgment on the part of the operator. If the abdominal viscera have not been too badly insulted, if no bile has been spilt, if careful cauterization of the stump has been done and a careful peritoneal toilet performed so that there is no oozing from the liver, results are better without drainage. The patient makes a more speedy recovery, there is less danger of adhesions and less danger of postoperative hernia. Drainage should always be done in a prolonged operation with insult to the viscera, where infected bile has been spilled, or where there is oozing from the liver, and where the cystic duct is friable and you are doubtful whether or not the ligature will hold. For this purpose I prefer a single Penrose rubber tube without gauze.

Whether or not the gallbladder is of much physiologic significance I do not know, but its pathologic significance is considerable and it is a potential danger as a source of secondary infection, as are diseased teeth, tonsils, prostate gland, etc.

My technical experience has taught me a few tricks which have simplified for me difficult cholecystectomies. I find that the placing of the patient in the reversed Trendelenberg position causes the abdominal viscera to drop lower into the abdomen. Thus they are more easily kept out of the way and the ease of approach to the gallbladder is facilitated. Another aid is to grasp the gallbladder with a smooth forceps and, when the diaphragm and liver descend on exhalation, hold steadily so that it does not ascend as completely as before. By doing this for several respiratory cycles, the gallbladder will often deliver readily into the abdominal wound.

I can see no objection to cutting the round ligament, and an upper pull on the cut upper end facilitates better exposure of the field. Another aid is the injection of 2 to 5 drams of sterile fluid behind the gallbladder. This is easily done by introducing a needle between the fundus of the gallbladder and its attachment to the liver. By gentle pressure upon the piston of an attached syringe the fluid infiltrates the cellular tissue and actually lifts the gallbladder from its bed, making dissection very simple.

The appendix should always be explored and removed during gallbladder operations, unless the pathology about the gallbladder or the condition of the patient make it inadvisable to remove or even to explore it.

In conclusion these points should be emphasized:

1. The value of proper clinical and laboratory study of gallbladder conditions.
2. In diagnosis cholecystography is a valuable aid.
3. Treatment is preeminently surgical.
4. Cholecystectomy should always be done if not definitely contraindicated.

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SURGERY OF THE GALLBLADDER IN SENILITY*

O. F. Lamson, M.C., F.A.C.S.
SEATTLE, WASH.

The reason for presenting this paper is that I believe there is too great a tendency on the part of the profession to discourage operations on the gallbladder in the aged, even when well marked evidence of disease of that organ is present and the patient has become consequently more or less a chronic invalid. Usually discouragement for an operation, which is the only means of relief, is given to the patient by saying or implying, "You are pretty old for an operation."

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Why the patient with a diseased gallbladder should be so carefully guarded by the surgeon and internist, while the equally aged with enlarged prostate, pelvic tumors, cancer, gastric and duodenal ulcers are treated by radical operation is a fact I cannot understand. Perhaps it is because of the old myth of "innocent gallstones," which no doubt had its origin in a large series of autopsies on patients who had died from various other diseases, but in whom gallstones were found without the history of gallbladder disease. It was, therefore, taken for granted that people could have gallstones without annoying symptoms.

My belief that these patients who have reached so-called "old age" are apt to be put off or neglected, when it comes to surgery of the gallbladder, is supported by the high percentage of these patients who have come under my observation in critical condition. They have aroused my sympathy because I recognize the fact that with advancing age the compensations for living lessen; and if health above all is gone or greatly impaired, there is little left to live for.

It has been my experience that the risk of operating on these patients, when they are properly prepared and there is no other serious organic disease, is not much greater than in younger persons. I am sure the mortality is or can be made lower than in prostatectomy, which is essentially an operation of the aged. If we refused to operate on these cases because of their age, there would be no prostatectomies performed.

In some clinics prostatectomy has become a very safe operation with a mortality as low as 5 per cent or even lower. These are naturally more hazardous than gallbladder operations because there is usually a much greater disturbance of the renal function. The low mortality in these cases undoubtedly is due to the greater care in the preparation of these patients for operation, when greater efforts are made to protect them in every way possible from the complications incident to advanced age. The results obtained in well advised and well executed surgery on the gallbladder in the senile are as brilliant as any other under similar conditions.

The preparation of these patients for operation is a subject which demands especial attention. It must include the careful and painstaking examination of the heart, as this organ may often be affected by the toxins absorbed from a chronically infected gallbladder. Further, the renal function must be considered more thoroughly than ordinarily. To avoid serious postoperative complications it must be forestalled by adequate preoperative treatment. Then, again our familiarity with the renal function before the operation will enable us to apply more prompt treatment when signs of postoperative renal insufficiency appear.

It is hardly necessary to mention the necessity for careful examination of the respiratory tract, as it is here where the patient is most likely to develop postoperative complications. The presence of any chronic or subacute respiratory disease must have most careful treatment to get the patient in the best possible condition for surgery. Of course persistent active respiratory disease may be such that an operation is inadvisable on account of the great hazard.

The pathologic condition of the respiratory system is our chief guide in the selection of anesthesia. We must necessarily avoid any anesthetic which would stimulate a quiescent disease of the respiratory tract or act as an irritant to a chronic disease present at the time of the operation.

There is another angle to surgery on the aged that must not be overlooked. When there is more than one disease that demands surgical interference, the operation must be for the one that is most urgent. Therefore, our examination must be most painstaking to rule out any other disease that may be present. One can easily appreciate the futility of removing a diseased gallbladder, when there may be present an obscure cancer of the bowel. The latter naturally should have precedence. A careful gastrointestinal examination would determine in most cases any gross pathology in the intestinal tract.

Diabetes is not infrequently present with gallbladder disease in the aged which by inciting a secondary pancreatitis may be a causative factor in its production. Diabetes is by no means a contraindication to operation; in fact, many of these cases will show marked improvement after the removal of a diseased gallbladder.

With all of our refined laboratory methods of diagnosis and testing the functions of the various organs, we are prone to overlook some of the more practical ways of determining a patient's resistance and ability to withstand surgical shock. It is usually a fairly safe rule that, if a patient is able to be about and perform the usual duties incident to an active life, he is a fairly good operative risk. On the other hand, if he is confined to the house most of the time and is an easy prey to the ordinary infections such as colds, etc., he must be very carefully examined and prepared for operation. I merely mention this in passing, as there is often a great tendency to base our conclusions on the routine examinations, on the various laboratory tests, and overlook the real physical tests based on what the patient has been doing in his daily routine life.

When an operation is decided upon, a patient who is somewhat below par because of old age and other factors that diminish his resistance, we must first of all do what we can to dispel the common fear for an operation. As a rule, the old are less affected with fear than the younger patients. The best and only method to accomplish this is to secure his confidence. Then only can one count on his cooperation.

If it is necessary for the patient to be prepared for the operation, it is best not to tell him about it too long in advance, as this would naturally interfere with his rest and sleep and thereby lessen his nervous resistance. It is soon enough to inform him of the necessity of an operation after the preparatory treatment has had satisfactory results.

The selection of the kind of anesthetic is important. I think in most cases ethylene should be the anesthetic of choice, as it gives good relaxation and causes a minimum of irritation to the respiratory and gastrointestinal tracts. In some cases it may be well to combine it with local anesthesia. My second choice of anesthetic is gas-oxygen and local, perhaps, with a little ether to produce better relaxation.

The postoperative care of these patients is not unlike that of any other abdominal case. To prevent hypostatic pneumonia, which is not an infrequent complication in old people, it is imperative that the position of the patient be changed frequently during the postoperative care.

It has not been my practice to allow these aged patients to be up any sooner than younger patients. In fact, I think they should perhaps have a longer postoperative rest in bed than the young because of the fact that they do not recuperate as rapidly as younger patients do.

I wish to present a brief study of thirteen cases that have occurred in my practice, whose ages ranged from 59 to 74 years; average age 66 years.

Six of these cases were what might be called "in extremis" at the time of operation. Two had ruptured gallbladders and bile in the abdominal cavity. One case suffered from pernicious vomiting that required rectal feeding for two weeks prior to operation. Three others vomited fully one-half of all food taken and were, therefore, in a considerably weakened condition. One patient had taken so much morphine for pain that she had become addicted to its use, requiring as much as two grains a day to keep her under control.

Three cases belong in a group, to which we might refer as subacute cholecystitis with histories of recurrent severe attacks of pain, necessitating the administration of morphine.

Four cases belong to a type commonly spoken of as chronic cholecystitis, three without stones and one with stones.

It is interesting to note that the results in the very ill patients and those in subacute groups were by far the most gratifying, undoubtedly due to the fact that the pathology was more definite and their condition more critical because of the acuteness of the disease.

Five of the very ill patients made a very satisfactory recovery, and have remained well. The time since the operations has been from eight months to five years. One male patient, 68 years old, had been a long sufferer from gallbladder disease. During operation it was found that a long standing inflammation about the gallbladder had formed there a dense mass of adhesions, almost completely obstructing the duodenum. He was not jaundiced at the time of the operation and, as this was an emergency operation on account of pernicious vomiting, no attempt was made to remove the gallbladder, but a posterior gastroenterostomy was done to relieve the obstruction. The vomiting persisted, following the operation, presumably due to dilatation of the stomach. He finally expired on the sixteenth day following operation from inanition and exhaustion.

I was handicapped in the postoperative care of this patient by the fact that I operated on him in a hospital ninety miles away from my home and was not able to follow up the postoperative care as closely as I would otherwise have done. Stomach lavage gave him relief, but he would not allow it as often as it was indicated.

Stones were present in all of these cases except in one. The three subacute cases mentioned above have had very good results following operation, just as satisfactory as the more acute cases.

Of the four cases, to which we refer as chronic type of cholecystitis, the results have not been as gratifying. A recent letter from one patient operated on five years ago gave the very disappointing information, "no improvement." However, there was some gratification in the fact that she did not say she was worse than before the operation.

To review her case briefly, she had a thirty year history of epigastric distress, sour stomach, bitter taste in the mouth, etc. X-ray examination revealed an apparent diverticulum of the first part of the duodenum. It was decided to operate to possibly relieve this condition which was thought to be cause of her symptoms. At operation a dumb-bell shaped gallbladder was found with a dense band of adhesions extending between the midportion of gallbladder and duodenum, causing a nacute angulation of the doudenum. I felt it was this condition that gave us the particular radiograph suggesting diverticulum. As there was also a marked hepatitis with enlarged glands along the cystic duct, cholecystectomy was performed.

X-ray taken a year later still showed indications of a diverticulum. Possibly I should have done a gastroenterostomy at the time I removed the gallbladder; but on account of the pathology found, it was thought cholecystectomy was sufficient, and that the adhesions between the gallbladder and duodenum was what caused the deformity in the duodenum, indicating a diverticulum. The diverticulum must have been on the posterior wall of the duodenum and concealed by the head of the pancreas. Therefore, it would not have been feasible to excise the diverticulum, and it could only have been treated by posterior gastroenterostomy and possible occlusion of the pyloric end of the stomach.

Another patient operated on three years ago had a long history of gastric disturbance, for which she had been treated medically for years without relief. During operation a thickened pale gallbladder with marked hepatitis was found. Consequently cholecystectomy was performed. This patient was completely relieved of her stomach symptoms and has remained well.

The other two cases in this series have been operated on less than six months ago. These are of too recent date to form any conclusions on the final results. But from the present indications in these cases I do not look for satisfactory results any way approaching the acute or subacute types of gallbladder disease.

As a whole, the results in this small series has been very gratifying, specially when the pathology was definite. While in the chronic types it was less favorable, I am inclined to think this difference would prevail in younger patients to the same degree. Therefore, it seems advisable to check up now and then on our chronic cholecystitis cases, in which we have removed the gallbladder, to see whether the results obtained are what we hoped to attain, particularly in chronic cases where no stones were found. It might be we are removing too many such gallbladders.

REPORT OF OPERATIONS

Anesthetics used:	Cases
Ether	2
Local and ether	1
Gas ether	6
Ethylene	4
Complications:	
Prolonged drainage (5 and 6 weeks)	2
Lavage for persistent vomiting	3
Diaphragmatic pleurisy	1
Bronchitis	1
Cystitis	1
Apoplexy (slight)	1
Opening of abdominal wound requiring second closure eight days after operation	1
Ventral hernia requiring second operation six months later	1

I am inclined to believe that early gallbladder operations in senility will produce a high percentage of good results with as low a mortality rate as in other serious operations, provided they are as carefully and as wisely treated. Let us not condemn these patients to a life of suffering simply because of their advanced age.

New Type of Examination for Medical Students. Mather Cleveland, New York (*Journal A. M. A.*, Aug. 21, 1926), relates the results of the new type of examination held by the departments of pharmacology, anatomy and orthopedic surgery of Columbia University. It is apparent that the new type test is a better measure of both reasoning and information because it is objective, it provides very wide samplings of materials and performances, it involves few irrelevant and distracting activities, and it may include problems of fact, of cause, of effect, of relations and of judgment which make as great and as genuine demands on the higher intellectual processes as those which are found in old type tests. Objective forms of questions seem to be as well adapted to the measurement of achievement in medical courses as in the average college course. Each of the nine forms of questions tried out in this experiment has considerable validity for medical school courses. The most effective seem to be the standard forms—true-false, completion and multiple choice; but with more adequate trials, the tabular forms of questions may prove to be as good as, or better than, the standard forms, particularly for certain aspects of medical work. The reliability and validity coefficients of the objective examinations described in this report are two or three times as high as those of much longer examinations of the old type in the same subject matter. The objective examinations measure "reasoning ability," as defined by the criteria now used in the College of Physicians and Surgeons, more accurately and more reliably than old type examinations of equal or greater length measure it. The reliability and validity of medical college grades based on old type examination have been found to be entirely inadequate. The first year of medical school work predicts second year work no better than high school average marks predict college success. The adaptability of objective forms of tests to medical school work demonstrated by this experiment suggests the hope that eventually there may be derived a series of objective, reliable and administratively convenient examinations on the common essentials of the medical curriculum, which will be universally applicable and which will afford accurate measures of defined achievement expressed in comparable and universally meaningful units.

DIET IN RELATION TO TRACHOMA*

B. FRANKLIN ROYER, M.D., Sc.D.
NEW YORK CITY
Medical Director of the
National Committee for the Prevention of Blindness

The relation of dietetic faults to various eye affections is not a new thought. In the Journal of Lewis and Clark, 1793, notes are found with reference to a famous clinic in the upper Columbia River country where more than forty applicants came with sore eyes in a single morning. Although Lewis was not a doctor, having only been especially coached on certain phases of medicine by Dr. Benjamin Rush before starting out on the trip, he makes this significant remark in commenting on the causes of the eye affections met with: "I suspect that the confinement to a diet of roots may give rise to all of these disorders (scrofula, ulcers, loss of the use of the limbs), except rheumatism and sore eyes, and to the latter of these the state of debility incident to a vegetable diet may immeasurably contribute."

Whether any of the Indians flocking to Clark for treatment suffered with trachoma is not clear, although Howard Beard, who has made a special study of Clark's notes, states: "It is probably correct to assume that trachoma was one of the major causes of the great destruction of vision and wide prevalence of sore eyes among them." Lewis, in commenting upon the habits of the Indians, most of whom, I take it, were then living in tepees, states: "The smoke is exceedingly disagreeable and painful to my eyes"; and in running comment with reference to the prevalence of eye disease, this statement is noted:

> "I observed an Indian woman who visited us yesterday blind in one eye, and a man who was nearly blind in both eyes. The loss of sight I have observed to be more common among all the nations inhabiting this river (Columbia) than among any people I have ever observed. They have almost invariably sore eyes at all stages of life. The loss of an eye is very common among them. Blindness in persons of middle age is by no means uncommon, and it is almost invariably a concommitant of old age. I know not to what cause to attribute this prevalent deficiency of the eye except it be their exposure to the reflection of the sun on the water, to which thy are constantly exposed in the occupation of fishing, and to the snows during the winter season in the open country where the eye has no rest."

After nearly two years of the hardships of traveling from St. Louis to the northwest coast, it is not surprising that Lewis should have found some of his own party afflicted, as the following paragraph indicates:

> "A very singular disorder is taking place amongst our party, that of sore eyes. Three of the party have their eyes inflamed and swelled in such a manner as to render them extremely painful, particularly when exposed to the light. The eyeball is much inflamed and the lid appears burnt with the sun. The cause of this complaint of the eye I can't account for. From its sudden appearance I am willing to believe it may be owing to the reflection of the sun on the water."

In this connection one might incidentally refer to the remedies offered the Indians by Lewis:

> "I use for sore eyes a solution of white vitriol (zinc sulphate) and the sugar of lead (lead acetate) in the proportion of 2 grs. of the former and one of the latter to each ounce of water.

Some experimental work seems to have been done some time, somewhere, on the production of eye affections by feeding experiments that has escaped the vigilance of those who have had occasion to review the literature of diet in relation to eye affections. McCollum, in his "Newer Knowledge of Nutrition," quotes Livingston in 1857 as stating in a description of the hardships endured in African exploration, having lived on sugarless coffee, manioc roots and meal for a long time, "the eyes became affected (as in the case of animals fed in experiment on pure gluten or starch)."

A large literature has been developed on the relation of diet to xerophthalmia and other eye infections within ten years, and for the most part within five years. The many feeding experiments promoted by research chemists, to separate and determine the influence of the various vitamins, resulted in the production of xerophthalmia in many experimental animals. This disease developed with great regularity when vitamin A was witheld in the diet. There were those who suspected for a long period of time that diet was the factor at fault in xerophthalmia afflicting human beings, but it has only been within a few years, with careful clinic studies checked off against faults of food intake and food absorption, that we have acquired precise knowledge of the cause of xerophthalmia in human beings.

Mori of Japan has described xerophthalmia among the 1500 Japanese children given a diet deficient in vitamin A, but readily showed how the disease could be cured or averted by the use of foods rich in vitamin A, such as glandular tissues like liver, or the oils from such tissues, such as cod liver oil and fish oil.

The great observation in Denmark, although started prior to the World War, was not convincingly confirmed until nearly the end of the war. In that country, with the butter fat practically all shipped out, for the most part to Germany, and with the other food shortages, hundreds and hundreds of children contracted xerophthalmia and many were blinded by it. When Denmark began home food distribution, as we did in this country shortly after we entered the war, and when they required that butter fats be given preferential routine to growing children, the disease suddenly ceased. Blegvad, representing the Danish Ophthalmological Society and Bloch, Denmark's leading pediatrician, have convincingly proved to science that this eye disease was due to a shortage of vitamin A.

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* Read before the Joint Meeting of the Montana Public Health Association and the Montana Oto-Ophthalmological Association, Billings, Mont., July 15, 1926.

Marginal blepharitis, which we once saw so commonly in orphanages and child-caring institutions, has largely disappeared with more liberal feeding and without great change in sanitation. It is pretty generally believed and taught now that phlyctenular keratitis is a nutritional fault susceptible of cure with a liberal diet rich in vitamin A; such a diet features strongly whole milk, whole wheat, bread, leafy vegetables, etc.

I am not advised by what process of reasoning he came to this conclusion, but the judgment of Dr. J. A. Stucky of Kentucky is reported in the Transactions of the Section on Ophthalmology of the A. M. A. in Atlantic City session for 1925, where he states:

> "The pathos of the whole trachoma problem is that frequently the disease returns and we have exacerbations and flare-ups, unless we continue the follow-up treatment by cleanliness and dietary measures. In the last five or ten years my ideas of trachoma, its etiology and treatment have undergone a decided change.
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> "After a trip of inspection a year ago over the territory where I held my first clinics, the change in the people as the result of right living, schools and district nurses is almost unbelievable, and I hope that as oculists we will caution against surgical treatment unless the diagnosis is unmistakable.
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> "Equal in importance to this surgical treatment is the diet, and when I have been able to keep the patient on a well balanced diet plus cod liver oil and malt for some months, there have been no recurrences of the disease in cases which I have observed for four or five years. The people in the mountains use little or no milk or butter, but they use highly refined flour and sugar, their food being cooked in a way to destroy the vitamins and mineral salts. I am increasingly convinced that trachoma will be proved to be one of the major deficiency diseases and is far less infectious than I once thought it to be."

In a later paper before the Southern Medical Association, published in *Southern Medical Journal* for February, 1926, Dr. Stucky in still stronger language shows how firmly he is convinced that there is a relationship between diet and trachoma. In personal correspondence this distinguished ophthalmologist has urged that the views setting forth an hypothesis that trachoma may be primarily a deficiency disease be given widespread circulation.

So much by way of introduction. What are the facts? It is very easy to raise a question but tremendously hard to provide the answer. I am obliged to tell you that the facts have not yet been developed. A hasty review of the literature, however, or any attempt to determine the distribution of trachoma geographically throughout the world brings the careful student squarely up against lines of thought that suggest seasonal or habitual shortages of food among those afflicted.

If one were to ask any professional audience in this country to give snap judgment concerning the diet throughout the year of citizens of Palestine, of Egypt, of interior China, of the Balkan states, or of those portions of Russia or even of the Prussian section of Germany with short summers and long winter seasons, with irregular employment, with frequent warring; or if one were to ask the possibilities of a well balanced diet twelve months in the year among the white people of the great Appalachian country or of southern Missouri or Arkansas, or of our American Indian wards, most of those in the audience would at once think of food shortages and of food supplies, seasonally at least, on a level you would not think of tolerating in the rearing of your children.

It was while studying trachoma in its world-wide distribution that I began asking myself, "Is it not possible that we may be dealing with a deficiency disease?" Or "may the lowered resistance of the eye tissues from improper diet be primarily responsible for the development of the disease?" And "may the irritation brought about by the inflammatory changes and the roughening of the lids be secondary to this food fault?" The later stages of the disease, such as thickening of lids, contraction and irritations from the turned in lids and irritation from rough granulations causing ulcers or pannus, these late stages we all look upon as due to trauma and as secondary to the original lesion.

It was in a search of the literature to determine if others may have considered the primary fault a dietary fault, that I found the record of trachoma in such a flux, with a complete absence of any epidemiologic study, really scientific and broad gauge in scope. It was not until two months after I began this scaning of the literature that Dr. Stucky's articles (the first of which I have referred to in this discussion) came to my notice.

I am very glad to tell you that others, too, have been thinking along the same line, because in a long conference with my old friend, Dr. Victor G. Heiser of the International Health Board, on June 30, he told me that he had tried to get a research several years ago made in Egypt with a definite hypothesis in mind that the primary fault may be a deficiency in some essential element of food stuff. I find that he had also several years ago tried to interest Dr. McCollum in attempting to produce the disease experimentally by manipulation of diet.

You will note that I cannot, therefore, claim anything original in my line of thought. In the presentation of these rambling remarks I only hope to arouse the interest of the audience to a point where they may give due recognition to dietary faults and to think of them at least as perhaps being as essential in permitting trachoma to develop as any other unproven thing. Do not, however, think of taking such a statement as final or conclusive, because much research needs to be done before it may be accepted as definitely proven, and a tremendous amount of material needs to be carefully recorded and evaluated before we may say that trachoma could not result without an error in diet.

Lest I be misunderstood, let me also say that this discussion does not intend to convey the impression that there may not be a bacterial or protozoan factor required in addition to a food fault in order to produce the disease. Certainly the irritation responsible for carrying trachoma to that stage of thickening seen in many cases, the stage that precedes the contraction or the turning in of the lid, would seem to require more than food alone, and perhaps more than just ordinary irritation in addition to food.

It would seem rational, therefore, in future studies that, in addition to making the usual observation in the field, complete data be gathered with reference to food habits of those who have the disease, over a period of years and for at least two years prior to the appearance of the first symptoms in the afflicted; and, further, that there should be additional research along the lines of etiology with the thought of either proving or disproving a specific factor other than food. There is need for a good deal of work to be done with experimental animals in the laboratory to determine the mechanism of the production of the disease.

Could any harm be done by definitely insisting upon a liberal diet as a part of treatment, a diet rich in butter, with whole wheat bread and leafy vegetables?

There is a tremendous job ahead to give the relief and opportunity for salvage of some vision or cure of the disease in the two or three generations of afflicted. This will require much larger sums than have heretofore been available. Any useful adjunct to treatment should be adopted. Perhaps Dr. Stucky is right.

As health officers may we not give heed to a possible relationship between diet and cause of trachoma, at least to the point of assisting with gathering that large amount of data which will be required before safe conclusions may be drawn? Shall we not keep our minds open and receptive, ready to accept what may be proven as the real causative factors and apply them?

The essential things for complete eradication of the residuum of disease, left after operation and relief measures have done their part, are yet to be determined. We must determine this health job and do it.

Note. A complete bibliography appears in the third edition of "The Newer Knowledge of Nutrition," by McCollum and Simmonds.

TRACHOMA.

ITS SURGICAL TREATMENT*

L. WEBSTER FOX, M.D.

PHILADELPHIA, PA.

The literature on this subject seems to be interminable. From the Occident as well as the Orient come unceasingly reports of the observations of workers in this field. Perhaps the latest to engage the attention of the ophthalmologist has been the series of papers dealing with the disease as it occurs among the North American Indians. The Bureau of Indian Affairs of the Department of the Interior, the American Medical Association, the several associations for the conservation of vision, the many societies dealing with the welfare of the Indians, as well as the countless individuals interested in the Indians, have found the subject of trachoma of sufficient interest to engage their serious attention.

The result of this awakening has been very beneficial to the Indian, although the divergence of views that has been brought to light, has at times given the situation a somewhat ludicrous aspect. Many have regarded it not as an Indian problem but a general problem, but for the purposes of its eradication we believe the former view to be more nearly correct.

To those of us handling the condition from a purely medical standpoint, the method of approaching it appears to be very simple. Here is an intractable (as a rule) infectious disease, imperilling the eyesight of the individual affected and many times invaliding him, and to our minds vigorous eradication of the disease focus is the one and only means of treatment, and even were the objections of the opponents of this plan to be granted, it would still be the only logical method of dealing with any condition of this character. All over the world those workers who have seen the greatest numbers of the disease are agreed upon this method of combatting the disease. In the trachoma countries other factors militate against the less radical surgical and medical methods.

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* Read at the Annual Meeting, Montana Public Health Association, Billings, Mont., July 15, 1926.

We have pointed out repeatedly that the very fact of the Federal Government's paternal interest in the Indians was a factor of supreme importance in the eradication of the disease. In no other country is there anything approaching a record of those affected or liable to be affected in so large a group. We have been taken to task for this statement, but this has been due rather to a faulty interpretation of the same. It is not our understanding that the Federal Government exercises such control and authority over these wards as to compel their acceptance of any vigorous surgical treatment for this or any other condition. We understand the Government's attitude to be one of advice and counsel, which is as it should be, in a country that emphasizes personal liberty. But the Government has a record of nearly 400,000 Indian people, that is impossible with any other group of scattered people, not excepting the Army and Navy. It is this record and tabulated knowledge that make possible the administration of any kind of group treatment, whether a medical, sociologic or economic problem.

This has come to be appreciated by those working in Indian affairs, and one of the results has been the edict of Commissioner Burke to compel the surgeons to acquire additional familiarity with the surgical treatment of trachoma. Another has been the intensive survey of the Indian people to determine the extent to which this disease prevailed among them. This latter has never been done very thoroughly in the past. A section here and another there have been worked over for a while and a report filed only to be forgotten, but a universal survey has been impossible owing to a lack of funds. Our own experience in delving into the recorded observations on trachoma in the Indian Service has been most unsatisfactory.

The interest developed in the last two years has served to remove that disadvantage just mentioned, and those who speak of conditions in the Indian Service, on a basis of knowledge obtained ten years or more ago, are at a decided disadvantage. The United States Public Health Service has been prevailed upon to extend cooperation and now the Medical Service in operation bids fair to rival that of any of the Federal agencies. My own feeling has always been that the surgeons already within the Indian Service were best fitted to cope with the problem, owing to their knowledge of the peculiarities of the Indian people, and this seems to be confirmed by the results of the last two years.

Our individual and personal interest has been with the disease trachoma in the individual Indian patient. We have seen it over many years, and we have seen it among Indian youths living under the very best hygienic conditions, namely the Carlisle School. Criticism has been levelled at the Government in the past for the system of boarding out these children of the great outdoors, but this criticism would apply with equal force to the boarding institutions of the white population. All vary, but the Carlisle represented the highest type, yet here we came in contact with the disease.

In these cases it was difficult to trace the origin of the infection. The presence of an active case begot others in the presence of the most rigid sanitary regulations. The system of prevention had broken down. Somewhere our theories were incomplete. This also happened in the early eighties in institutions for the white people, but cleaning up of the general conditions was followed by a rapid subsidence of the disease. But the Carlisle school was never in this class.

Our experience here taught us that eradication of the disease focus in the individual patient, before it had opportunity to eradicate itself by destruction of the part affected (namely the eye), was the only treatment. Among the native whites, and even among some of the foreign born residing among us, a measure of success follows the persistent use of local applications, largely due to the variation and attenuation of the virus or whatever it is that causes the disease. But the Indian enjoys no such variation, if there be any; each case seems to be worse than the preceding one. No clinic among the white people shows any more pronounced cases than the clinic at Albuquerque, for instance.

Surgeons of the Indian Service up to as late as ten years ago will bear me out in the statement that local applications to the eyes of the Indian patient were a waste of time, and will go further and state that it was questionable if any treatment for the trachoma would succeed, there were so many contributing factors arrayed against them. But our experience with the Carlisle students made friends for us, first at one reservation and then at another, with the ultimate result of having our method of handling these cases, surgically, rather universally adopted, although with modifications suitable to the conditions and the individual operator.

To Darier of Paris we are indebted for the method of eradication of the active granulations, known as "grattage." The value of this lies in the exent to which the granulations are treated. The narrow-bladed toothed forceps provided with a ratchet in the handle similar to a hemostat makes possible the turning of the upper lid twice upon itself. This permits bringing into the field the swollen and granulomatous folds of conjunctiva which are otherwise buried in the fornix and inaccessible.

The roller forceps and the method of expression of the granulations by the fingers never reaches the diseased conjunctiva in this area. The good results following these methods are predicated upon a mild type of the disease.

It might occur to many thoughtful surgeons that excision of the diseased conjunctiva at the very start would satisfy all requirements, but this has been given serious consideration by all the ophthalmic surgeons of experience in this disease, only to be discarded as not the most desirable for the cases in the granulation stage. The Egyptian experience, which is perhaps the most elaborate and reliable, reports the best and most lasting results from grattage, supplemented by mercuric cyanid applications.

Our practice is, after everting the lid, to scarify all the trachomatous area with the three-bladed knife also devised by Darier, after which it is vigorously brushed with a tooth brush steeped in a bichlorid of mercury solution (1 to 2000) until the base is white and clean. The lid must be turned a second time and the procedure repeated here also. The cornea is safeguarded meanwhile by a horn spatula placed beneath the lid and held by an assistant. Retaining the basal conjunctiva permits of a certain amount of regeneration and limits the cicatrization. The immediate effect of the procedure is to occasion a slight reaction, but nothing like what would be anticipated from the vigor of the operation. A sedative application such as hot lead water and laudanum or the special lotion* will control this.

It may be that unfriendly comment would claim that this frequently needs be repeated. One case of this character is all that is required to furnish ammunition for critics so inclined. In point of fact, in the selected case it never needs to be repeated, but in treating a large group, all cases must be given the benefit of a reasonable chance, and this as well as other procedures is employed even in the face of well-recognized discouragement. Many patients will be neglected, if the maintenance of a perfect record is the only desideratum. However, a comforting feature prevails even in these cases by the fact that the patient returns to his original surgeon for a repetition of the grattage; it has given him more relief during a stated period than any other method, and he wants it repeated by the same surgeon, a most complimentary situation.

Our ocular troubles in trachoma, as you well know, have their origin in the upper lid, but frequently express themselves in the pathologic changes in the cornea. The keratitis that supervenes is attended by vascularization of the cornea, nature's effort to maintain its integrity through the long siege of irritation and friction which it seems to realize is certain to take place. In other corneal conditions ulceration and scar replacement are rapid, here it is slow. This vascularization of the cornea gives rise to the classical salmon patch or pannus. Removal of the granulations causes a rapid improvement in the condition of the cornea.

Pannus, however, calls for treatment directed toward the cornea, despite the fact it is a secondary condition. The use of atropin must not be neglected. If the vessels leading into the cornea are but a few, they may be severed by a few strokes of a sharp Beer knife. But if from the entire circumference of the cornea, the excision of a strip of conjunctiva surrounding the cornea for about 1 mm., a peridectory may be performed. This is very effective and heals within a few days. For some reason the value of this little operation has failed of proper appreciation among American surgeons, although abroad it is commonplace from the frequency with which it is employed.

The possibility of reaching trachoma by vaccines, serums and other biologic preparations seems to me to be very remote, although subcutaneous injections into the thigh of sterilized milk has given me very

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* Special sedative lotion:
Rx
Liquor plumbi subacetatis dil., 7.39 c.c. or drams ii
Tincturae opii
Tincturae, aa, 5.53 c.c. or drams iiss
Tincturae Arnicae, 34.00 c.c. or ounce i
Aquae camphorae
Aquae destillatae, aa, 120.00 c.c. or ounces iv

good results in other purulent conditions of the anterior segment of the eye. The use of jequirity and its derivatives we do not consider to have any place in the armamentarium of the modern occulist. There is, however, a possibility of radiotherapy being developed to the extent of being of some value, but our experience with it does not justify its use to the exclusion of the surgical methods. Speculation as to the value of electrolysis and desiccation is certain to enter any discussion of this subject, but we fail to see that such elaborate technic as these methods entail would do more than eradicate the individual granulations, and certainly require a greater amount of time to accomplish the same end.

There is one point in trachoma that has not been sufficiently stressed and that is that disastrous developments are frequently due to the acute inflammations that become superimposed upon the trachoma. MacCallan made this observation in Egypt and is one in which I readily concur. This emphasizes the need of reducing the conjunctiva to a quiescent condition as rapidly as possible, since the prolongation of the condition renders that membrane a ready prey to the Koch-Weeks bacillus and the gonococcus.

The passage of the case from the typical granular stage with discharge to the cicatricial stage is marked by all kinds of gradations and combinations. The virulence of the infecting agent declines likewise and it is not unusual to find an old case with all kinds of deformities from scarring, in a group of comparatively healthy individuals, without disseminating the condition to any of them. It is this kind of a case that is used for argument to discredit any program which considers handling trachoma as any other infectious contagious disease would be handled.

In the Indian Service, as in any other large clinic, all grades of the diseases are encountered, and when cicatrization supervenes, the active disease as a rule is no longer with us. But the patient is suffering and we must try to provide relief. In these cases the excision of the tarsal cartilage of the upper lid is indicated. But as with grattage, it is not always successful, but unlike grattage, we can do it but once. But when successful, it is unlike any other treatment in the comfort it provides.

Many patients in the cicatricial stage show such pronounced lacrimation that some surgeons have directed their activities entirely to the lacrimonasal passages, arguing that a focus of active disease still existed in that region. This does not conform with our observations and experience. We have found many cases to be improved by attention directed to the entropion that ensues. Thus the well-known procedure of slitting the cartilage of the upper lid, devised by Burow, a European surgeon of large experience, has worked wonders in many simple cases of entropion in this disease. Also the excision of a V-shaped strip from the ciliary margin with the removal of a row of adventitious eyelashes if present, with or without the insertion of a skin graft devoid of hair (Hotz's operation), has found a certain field of usefulness. But the removal of the tarsal cartilage meets so many indications simultaneously that most surgeons advocate its removal in all cases. We reserve it for the later cases.

The patient suitable for resection of the cartilage usually presents some other features of the disease that demand attention. Scarring is taking place in all directions and efforts must be taken to prevent encouraging the entropion which is a potential possibility in all these cases. I do not feel that this has been sufficiently emphasized, and fear that some of the men doing this for the first time assume its failure, when it does occur, to be inherent in the operation or the operator, instead of its being due to the improper recognition of all the phases of the disease that have been present in the particular case.

Assuming the presence of a patient before us for resection of the tarsal cartilage, I will proceed to give the technic of the Kuhnt-Heisrath operation as I perform it.* General anesthesia is absolutely essential. It cannot be done under local anesthesia. The eye having been irrigated, the upper lid is everted over a horn spatula and held in that position by a toothed forceps engaged in the lid at the ciliary margin. This may be entrusted to an assistant to hold. Sometimes these are combined, that is, the forceps are fastened to the spatula. Again, we have devised a large fenestrated lid clamp after the fashion of the chazion clamp, only larger and rectangular in shape. This makes for ease in handling the lid, especially when assistants are few and untrained. The character of the knife employed likewise renders the operation more satisfactory to the operator. A very sharp, and a very heavy-bellied knife is essential. With this an incision, starting at either canthus, is made through the tarsus within two mm.

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* To Kuhnt-Heisrath the credit has been given for the resection of the tarsus but, if we refer to the treatise of John Cunningham Saunders, the founder of Moorfield's Eye Hospital, London, "Diseases of the Eye," 1811, third chapter, we find that the he deals with the cure of the inversion of the eye-lid by excision of the tarsus.

of the edge of the exposed lid around its entire circumference. This must be perpendicular to the tarsus, leaving a right angle edge to the wound; otherwise a bias edged wound will retain some of the tarsal curve which it is desirous to be rid of. A pair of small scissors, preferably the blunt pointed muscle scissors of Stevens, are used to remove the tarsus and overlying conjunctiva within the area outlined by the initial incision. The conjunctiva in the upper fornix is then drawn down and sutured to the ciliary margin of the lid by silk sutures. These are tied on the skin surface of the lid. Some operators disregard the use of sutures. They have advantages, but they may have disadvantages. It will be readily anticipated that there is a possibility of inducing entropion by this very feature. My technic includes the sutures, but if it is likely that the patient pass beyond my observation, as in the case of the Indians, I supplement the operation with a few punctures of the upper lid with the galvano-cautery. The ether gauze or cone must be removed to a safe distance and dry gauze placed over the patient's mouth to prevent fire or explosion. Sometimes a canthotomy or peridectomy is performed for the reason.

This treatment in a large group will give more immediate and more lasting results than any others. This has been demonstrated in the last two years in the Indian Service, and the program now in force gives promise of greater results than the Service has ever known in any epidemic it has encountered.

The discussion of trachoma among our Indian wards has led many to assume that here we had a separate and independent problem, distinct from that created by the disease among other people so situated. But we find that G. Freeman Heal (*British Journal of Ophthalmology,* April, 1926), who was in charge of the Ophthalmic Department of the Iraq Government Hospital at Bagdad, observed that almost all the Arabs have trachoma. Here is a nomadic people resembling in many respects our own Indians. This condition he attributes to the unsanitary conditions under which they live, and their utter disregard of personal hygiene. He finds conditions so pronounced that radical operations are imperative for the relief of the distressing symptoms, although he does not belittle the value of the educational campaigns, but as with us we cannot wait for the returns; something must be done immediately in most instances.

His treatment naturally takes into consideration the relief of the trichiasis which appears to be present in most cases. Consequently we find him to be a strong advocate of removal of the tarsus, largely after the method of Heisrath, and as practised by MacCallan in Egypt. This bears a deadly parallel to our experience among the North American Indians. But his technic varies somewhat from ours, inasmuch as he dissects the tarsus from the muscle and skin side of the lid, far above as possible. The tarsus is then severed from its attachments at either extremity. Sutures are then introduced at the ciliary margin and again at the free margin of the conjunctiva above. The excision of the tarsus is then completed and the sutures tied. This operation is performed under local anesthesia, using novacain and adrenalin by injection.

It is not at all out of place to refer here to the work of N. Shimkin, another modern worker in this field, and at present Chief Ophthalmologist of the Hadassah Medical Organization, Haifa, Palestine (*British Journal of Ophthalmology,* May, 1926). This surgeon has had an enormous experience among the natives of Palestine which well illustrates what may be accomplished by intensive effort and will afford great encouragement to the workers in this country. The report is long but worthy of careful perusal.

GLAUCOMA SYMPTOMS*

C. C. ALBRIGHT, M.D.
GREAT FALLS, MONT.

Having overlooked several good cases of glaucoma myself and wondering how many other eyemen have done the same thing through neglect and hurry, I thought that a few well worked out symptoms well emphasized would help the general practitioner to recognize some of these cases as well as ourselves. How many eyes have been lost in this melancholic and deplorable oversight?

A generation ago a leading British ophthalmic surgeon stated at a medical meeting that he felt strangely disposed to take the front page of a leading medicine journal and advertise on it in large letters the leading signs and symptoms of glaucoma, in the hope of directing the attention of the profession to the danger of overlooking this very serious condition, when it occurs in everyday practice. Years have roled by and a new generation of doctors fills the places of the men of that era, but it may be questioned whether the mistakes this critic lamented have become any less frequent.

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* Read before the Forty-eighth Annual Meeting of Medical Association of Montana, Billings, Mont., July 16-17, 1926.

Elliott says, "When we remember that glaucoma is to be classed among the emergencies of surgical practice, that as a rule the diagnosis of an average case is extremely easy, and that the standard of professional knowledge and of professional training has gone up by leaps and bounds during the last twenty-five years, why are so many cases of glaucoma now overlooked?" Is glaucoma a condition that needs a highly trained specialist for a diagnosis? Some cases may indeed be hard to distinguish, but in the great majority of instances the diagnosis of glaucoma is easy for any medical man.

A well known London physician who has recently passed away kept posted above his shaving glass a short list of the signs and symptoms of glaucoma in order that he might not fail to diagnose such a case if he met with it in his practice. His example might wisely be followed with profit.

Modern surgical methods have revolutionized the treatment of glaucoma and have made it possible to save a patient's sight, always provided that a diagnosis is arrived at sufficiently early. There are very few diseases that are more easily diagnosed than an ordinary attack of congestive glaucoma and there is certainly no surgical emergency which is more susceptible to early action and suitable therapeutic treatment, while the modern operations have made the surgical treatment of increased intraocular pressure both safe and certain so far as surgical procedure can ever be said to be either.

Once an eye shows signs of glaucoma, even though these signs are nothing more than the rainbows around lights, the transient mists and the ill defined headaches, and pains in and around the eye, that eye is definitely glaucomatous and to hold any other opinion is to bury one's head in the sand. Without differentiating between the noninflammatory and congestive types, it is all the same disease.

A case of simple glaucoma may walk into your office, in which the signs of congestion are absent. The patient has never suffered a day of pain and the troublesome headaches, rainbows and mists, which punctuate the early stages of the congestive form are never mentioned. The pupil is often dilated but may often be normal in size. The iris reacts sluggishly to light and good central vision is often retained till a very late stage, while the shrinking of the visual field is well marked. The result is that many patients complain they feel as if they were looking down a tube, and in walking they turn the head from side to side to prevent running into objects.

The disease is always bilateral but one eye may be affected sooner than the other, and when we examine a patient we will find these three points invariably present: (1) a cupping of the optic disc, (2) a fall in the normal acuity of central vision, (3) a characteristic limitation of the field of vision.

To these may be added the occurrence of vascular storms of slight intensity which may attract but little attention and can only be detected by careful periodic examinations of the patient. If in these case a tenometer is used at frequent intervals, a rise in intraocular tension will sooner or later be found. According to Kollner, the intraocular tension in simple glaucoma reaches maximum between 10 and 11 a.m. and drops rapidly to a minimum between 3 and 5 p.m.

Loss of vision in simple glaucoma seems to flow quite evenly from start to finish. However, we see many cases where the loss of one eye may pass unobserved till the other becomes so impaired that it bothers the patient to do his ordinary duties.

CONGESTIVE GLAUCOMA

A pronounced attack of congestive glaucoma may begin without any previous warning of any kind. But usually this is heralded by the so-called prodromata. Then, too, we may see a simple glaucoma that has gone on for years before congestive signs appear. However, the average case will tell about pains in the eyes and headaches, together with appearances of rainbow rings around bright lights viewed in the dark. Some complain of flashes of light, resembling summer lightning flashes, while others complain of a wall of light which rolls in front of the eyes. A surgical examination made at this time will reveal the presence of a steamy cornea and a shallow anterior chamber. These attacks are usually traced to periods of bodily exhaustion, to sleeplessness or to mental worry. Another symptom is the sudden increase of presbyopia.

If there is one pathologic condition more than almost any other to which the term "relentless" can be applied, it is the one we are discussing. These so-called prodromal attacks are merely the early stages of congestive glaucoma. The progress of degenerative changes in the eye is monthly, weekly, daily, imposing an increasing barrier to the free escape of fluid from within the globe. As time goes on these attacks become more frequent and severe. The intervals lessen, the duration of the crises increases, and the eye is from the first in the grip of a disease which, though it may vary in speed and progress, is nevertheless as resistless as the rising tide and an actual stage of glaucoma is established.

A glaucomatous attack may be described by the patient as a severe trigeminal neuralgia, usually referred to the eye or forehead. This may be so severe as to give rise to nausea and vomiting. These conditions are sometimes spoken of as "bilious attacks" with most disastrous results, for the opportunity to apply immediate and suitable treatment is then let slip. An examination at this time shows loss of vision and a marked contraction in the field of vision. At the same time it is noted that the eye is distinctly congested. It may show chemosis. The cornea is steamy and insensitive, the pupil widely dilated and often irregular and oval in outline. The iris appears discolored, though this effect is partly due to being seen through a steamy cornea and a cloudy anterior chamber. The latter is shallow; the lens has a peculiar green look, from which the disease has derived its name glaucoma which means sea green. The eye is very tender and the patient shrinks from the slightest touch; under gentle examination it is felt to be extremely hard. After a varying period which may be hours or days, according to the severity of the attack and the treatment given, the symptoms subside and the acute stage passes off but the eye is never the same again. It has been permanently though possibly only slightly damaged and every succeeding attack increases the damage done.

The eye may regain its normal appearance or condition, or chronic congestive glaucoma may occur at frequent intervals. We have now reached a state of affairs, where every sign of glaucoma is present. The visual acuity is much diminished, the field of vision much contracted. The blind spot is characteristically enlarged and the tension of the eye is distinctly above normal, though not as high as during the congestive stages.

The circumcorneal zone is congested, the perforating vessels distended, the anterior chamber is shallow, the cornea is clear between attacks and is quite anesthetic. The pupil is moderately or widely dilated and oval in shape, the long axis being vertical. The iris is sluggish. In the intervals between attacks, when the cornea and chamber are clear, an ophthalmoscopic examination reveals the cupped disc, surrounded by a ring of atrophy, the constricted arteries, the congested veins, the vascular pulsation and the tessellated fundus which are met with in glaucoma.

And now we come to the third and last scene of this terirble drama. Pushed at first gently, gradually and imperceptibly on its downward road, hustled later by congestive attack toward its doom, the eye passes on to blindness to merit the time-honored classification under the term absolute glaucoma. Written large over the portals through which he has passed are the words of despair, "abandon hope, all ye who enter here." Some, of course, will claim they have some sight.

These intervals of hopeless gloom will be lighted by a curious phenomenon which may be described as luminous haze, which may last for hours or even days at a time. DeSchweinitz had a patient who, though totally blind from glaucoma, declared that all things seemed to be a sea of fire. Even some are found who will sit by a window, look out and see all the features of a scene with which they were familiar in childhood, and yet on examination the eyes are absolutely blind. To this condition the term "memory sight" may be applied. It is indeed a pitiable delusion born of memory and imagination, of hope and despair. On examination one finds the porcelain-like blush, white sclera against which the dilated anterior ciliary veins show up in vivid contrast. The cornea may be clear but it has little or no sensibility, anterior chamber shallow, iris almost receded from sight under cover of the overhanging limbus. The green reflex, the stone-like feel of the eye and the dead white deeply cupped optic nerve head complete the picture for the time being.

Degeneration has yet to play its part. Glossy looking deposits may cover the cornea, whose surface may become the seat of zonular opacity or vessels may develop beneath its epithelium. Equatorial staphylomata may make their appearance and cataract may develop. Even now the unfortunate patient may not be at the end of his sufferings, for severe bouts of pain may add to the congestive attacks which continue long after all sight has vanished. The condition is that of "the blind painful eyeball of glaucoma." Finally, secretion appears to stop or at least so greatly diminish that the eyeball shrinks and softens, and the wretched sufferer at last finds rest from what seems to him to have been an age-long pain, unless perhaps he is unfortunate enough to have engrafted on all else he had to bear, intraocular hemorrhage, ulcer serpens, perforations, iridocyclitis and panophthalmitis. At last the curtain falls on phthisis bulbi.

A melancholy story, indeed, and one to which failure to adopt a proper treatment has to often largely contributed. The depth of its sadness can only be measured by those who remember that glaucoma is a binocular disease and that it affects in most cases those who, right up to middle and advancing age, have known to the full all the pleasures that flow from sight.

TRAUMATIC EROSION OF THE CORNEA FROM THE EFFECTS OF ETHER

Harry V. Wurdemann, M.D., Sc.D., F.A.C.S.
SEATTLE, WASH.

For years the author was particularly interested and had much experience with injury to the eye, ultimating in 1912 in a book of 926 pages which now threatens another edition, owing to the lessons learned from the war and the novel forms of ocular injury resulting from chemicals and other injuries, particularly in the last decade. In this rather large volume, purporting to treat of all forms of ocular injuries, in his own separate papers, and in the literature, he has not so far found one very interesting form of injury which, however, must occur far more frequently than is supposed; for, while it is possible that actual trauma does not often occur, the causus materiæ obtains many times a day.

It is a habit of some anesthetists in the administration of ether to touch the cornea with their finger in order to determine full anesthesia by the loss of the corneal and lid reflex. It is possible that horny handed anesthetists may at times abrade the cornea, but the anterior layer of epithelium is usually restored within twenty-four hours. As we oculists often see it from drying of the cornea after instillation of cocain, nature restores the skin of the eye before the patient is fully recovered from the anesthesia and he knows nothing about it. It is possible, too, that ether is often inadvertently dropped into the eye.

Ether acts like alcohol and a prolonged application certainly kills the anterior superficial layer of epithelium, and in some instances, if the eye is not sufficiently clear of germs, may give rise to an infected ulcer. The causus morbi of such cases as well as the eye itself, however, is undoubtedly kept covered up and hence cases do not creep into print. The effect of ether on the eye, however, has been called to my attention in two of my cases, the latest of which happened a short time ago.

Case 1. A woman, of 54, who on April 14 reached for the wrong bottle, supposing she was using a zinc collyrium, put the dropper into a collodium bottle, thinking it to be the eye drops. On examination April 19, the lower one-half of the cornea was found to be exfoliated and about one-fourth of this area was covered with filmy pus. Immediately below the cornea the limbus of the conjunctiva was white and looked as if a caustic had been applied. The whole lower half of the cornea stained by fluorescin solution. The appearance was that of a lime burn. Speedy healing resulted from the use of atropin, dionin, the latter of which relieved the pain, and 1-1000 bichloride of mercury ointment, together with hot compresses. Patient discharged one week later with nebula of the cornea.

Case 2. Man, aged 31, had an appendix operation at a local hospital July 24, 1923. Was seen by me September 20, then having a cornea insensitive to touch with central erosion of the anterior epithelium and superficial ulceration. Complained of intense pain which at the hospital had not been relieved by codein, morphin or local applications. He could not open his eye; had intense blepharospasm. Healing occurred under hot compresses, dionin and antisepsis. History was given of ether having been dropped in his eye at the time of the operation, but nobody connected with the case acknowledged it. This man later developed a hardened eye and diagnosis of glaucoma was made, the Elliot operation of trephining being done at the Swedish hospital October 31.

This patient always showed evidences of exaggeration; blamed the first hospital he had been in at the time of his appendix operation; sued the hospital for $25,000, this being thrown out of court; sued the doctor who gave the anesthetic, blaming him for blindness of the right eye, due to improper bandaging when the ether was administered. Although the jury awarded him $15,000, it is understood that the case was later thrown out of court. Of course, I was importuned by the man and his lawyer to appear as a witness, but refused to go for self-evident reasons.

Needless to say, this patient was not only ungrateful for the saving of his life by the appendectomy, and was likewise for the healing of his eye by the oculist, never paid his professional attendants anything, the accounts being uncollectable, but likewise tried to make some money out of them. The first stand taken by the oculist probably also prevented a malpractice suit on this account.

These two cases are reported for reason, in the first case of the "mistaken label" application and the undoubted effect of the ether, and in the second for the supposed effect of the ether and the subsequent actions of the patient.

"Milk Sick," or White Snakeroot Poisoning. W. E. Walsh, Morris, Ill. (*Journal A. M. A.*, Aug. 1, 1926), says that when man consumes the milk of cows that are eating white snakeroot, or butter made from the milk of these cows, he injects a poison that causes fatty degeneration of all the tissues, especially the liver and the pancreas. It is probable that the snakeroot poison destroys so many cells that the body is incapable of carrying on its normal chemical processes and that, consequently, there is a recurrence of acidosis every time the individual attempts to eat normally or work to capacity somewhat the same as in diabetes. No sugar was found in the urine in any of these cases. The treatment, in brief, is one-half drachm (2 Gm.) of sodium bicarbonate and 1 drachm (4 Gm.) of magnesia magma every hour and after vomiting until the bowels move freely. To this is added an enema of 2 ounces (60 c.c) of sodium bicarbonate in 12 ounces (385 c.c.) of warm water four hours until the urine turns alkaline; the treatment is continued by mouth until a 10 per cent solution of ferric chloride in the hands of the nurse does not show any mahogany colored precipitate in the urine. The diet is skimmed milk, orange juice and custards.

METHODS OF ESTIMATING HEMOGLOBIN*

Howard D. Haskins, M.D.
and
Edwin E. Osgood, M.D.
PORTLAND, ORE.
From the Department of Bio-Chemistry
University of Oregon Medical School

Our attention having been called to the fact that many clinicians are poorly informed as to the reliability of current methods of estimating hemoglobin, it seemed to us that a brief review of these methods would be of interest.

1. *Van Slyke's Method.*[1] This is the best method for research purposes, so that it should be used for testing and checking up all clinical methods. By this method the oxygen capacity of the blood is determined. The hemoglobin content is calculated from the amount of oxygen secured from the blood and measured as the free gas in Van Slyke's special apparatus (which is the same as that used for the estimation of the alkali reserve, i.e., the CO_2 combining power of plasma). The technic of the method is exacting, so that estimations should be made only by a very careful technician who has become expert in using the apparatus. Furthermore, we found that for research purposes it was not safe to depend on the result of a single estimation. To reduce our probable error below one per cent we took the mean of several Van Slyke's estimations.[9] This method is not suitable for routine clinical work.

2. *The Acid Hematin Modification*[2] *of Palmer's Method.* This involves the use of a colorimeter and the preparation (about once a month) of a standard solution of acid hematin. The latter is made by first estimating hemoglobin in a sample of fresh blood very carefully by Van Slyke's method, and then preparing from the blood (by dilution and treatment with HCl) a rather concentrated acid hematin solution of exact strength. This is kept in the icebox. A more dilute solution is prepared every few days for use in the colorimeter. The method is very good, but requires an expert to make the standard solution. It is quite suitable for research work, if the investigator is competent to secure accurate Van Slyke estimations.

The other methods which we shall discuss are feasible for clinical work.

3. *The Tallquist Method.* A drop of blood absorbed by blotting paper is compared with printed colored standards. This has been used extensively, but the possible error is very considerable. The following are some routine estimations that we have secured, the correct per cent being given in each case in parentheses: 43 (35), 55 (43), 70 (50), 80 (117), 80 (122), 80 (123), 85 (65), 85 (107), 90 (111), 95 (139), 100 (101), 100 (112), 100 (112). It will be seen that several perfectly normal bloods in this list are represented as anemic by this method.

4. *Dare's Method.* This is another quick method. Light is passed through a thin layer of untreated blood and the color is compared in a special apparatus with the color secured by passing light from the same source through different thicknesses of colored glass. In using this method the eye tires rather quickly so that errors in color matching occur frequently. Also, two observers using the same blood in the same hemoglobinometer will report different per cents. Most of the results which we report were secured with a special apparatus rented for the purpose from the instrument maker. Illustrations of our estimations are as follows (the correct per cent being in parentheses): 35 (58), 47 (56), 60 (79), 60 (86), 79 (75), 80 (100), 87 (81), 96 (97), 97 (102), 99 (105), 103 (115), 105 (122).

Brown and Roth[3] recently examined a large number of bloods. Only one-half of their Dare estimations on distinctly anemic bloods (30 to 75 per cent hemoglobin) were within 5 points in the per cent figure of the correct estimations. Even more important is the fact that 42 per cent of their estimations in this range of hemoglobin content indicated much greater anemia than actually existed, the error being more than 5 points below the true per cent. In the case of bloods having more than 85 per cent hemoglobin the estimations are also unreliable. Brown and Roth secured estimations of 67 to 78 per cent by Dare on 30 bloods having an actual content of 95 to 105 per cent. Thus normal or borderline bloods were made to appear as definitely anemic.

5. *Newcomer's Method.*[4] This is an acid hematin method, the standard being a thin piece of colored glass. Bausch and Lomb now furnish a special Newcomer colorimeter (for hemoglobin estimation only) which gives direct readings of per cent of hemoglobin. We have used the original method and also the new colorimeter. Errors by

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* Read before the Academy of Medicine, Portland, Ore., May 13, 1926.

this method ran as high as 13 per cent and few of our results were within 5 per cent of the correct hemoglobin content. Illustrations of our estimations* are as follows (the correct per cent being in parentheses): 30.6 (31), 53 (62), 55 (59), 76 (80), 80 (90), 92 (105), 94 (96), 102 (114). In all these estimations we developed the maximum acid hematin color before putting the blood mixture in the cup of the colorimeter. We found greater error when we followed Newcomer's directions and made a time factor correction in accordance with his table.

Senty[5] examined by two methods (Newcomer's and an accurate acid hematin method) 37 bloods containing less than 80 per cent hemoglobin. Of these 40 per cent of the Newcomer estimations were wrong by 10 per cent or more. This statement is made as a result of our study of Senty's data. Senty does not call attention to this divergence from accuracy.

Lindsay, Rice and Selinger[6] have reported Newcomer estimations, showing less than 5 per cent when the blood contains at least 10 gm. Hb. per 100 c.c. (see chart 2) but considerable error in the case of bloods of lower content. They suggest using two color disks instead of one and taking double the usual amount of blood. Their curves show greater accuracy by this procedure in the case of bloods having less than 9.5 gm. Hb. per 100 c.c.

Criticisms of the Method. The standard is too pale, so that it is difficult to match colors. There is a feeling of uncertainty as to when matching is secured. Newcomer states that the color obtained with his disk (1 mm. thick) is optimum for close matching with acid hematin, which implies that the use of a thicker disk or of two disks would not be advisable. Artificial light gave better color matching than good daylight with the Bausch and Lomb Newcomer; in fact, we found it almost impossible to make estimations with daylight.

The figure selected for this colorimeter as 100 per cent hemoglobin (16.92 gm. per 100 c.c. blood) is subject to severe criticism, it being much too high for the average hemoglobin content of normal adults (see the discussion of the hemoglobin coefficient in Osgood's recent article[8]).

6a. *The Sahli Method.* This is an acid hematin method, using a special comparator for color matching and a special standard. The ordinary type of Sahli apparatus is worthless because the acid hematin used as the standard fades too rapidly. Other color standards have been used by manufacturers but none have been satisfactory. The Kuttner, Leitz standard, for example, was not of the right color. The new Leitz apparatus has two cylinders of colored glass instead of a standard solution. Unfortunately the type of color is incorrect, so that it cannot be matched with dilute acid hematin. We cannot recommend this apparatus.

When a correct standard solution is used in the Sahli (e.g., a freshly prepared acid hematin solution of exact concentration made with research accuracy in the same manner as for method 2), the estimations are surprisingly accurate under certain conditions. These conditions are (1) that the inside diameters of the graduated tube and of the tube containing the standard solution must be the same, and (2) that the Sahli pipette and graduated tube must be accurately marked. These specifications can be met and without unreasonable extra expense.

6b. *The Haskins-Sahli Method.* Haskins[7] has prepared a standard solution for the Sahli that has the right color and is permanent. It contains only inorganic salts and has not changed in a period of over three years. An estimation of 100 indicates that the blood contains 13.8 gm. Hb. per 100 c.c. One hundred per cent means the same, therefore, as with the Dare and most other hemoglobin methods, but it must be borne in mind that this does not correspond to the average hemoglobin content of the blood of normal adults. Osgood[8] has recently determined that for normal young adult males (19 to 30 years) 106.5 per cent is the average, when calculated to a red cell count of five million, so that for color index calculation this figure (in the case of young males) should be taken as 100 per cent Hb.

The Haskins-Sahli method easily gives results with less than five per cent error in routine work, when the specifications mentioned above are met, provided the technician is reasonably expert at color matching. Still greater accuracy is possible when research care is used, illustrations of such results are as follows (estimations by Van Slyke's method are given in parentheses): 97 (96.7), 99 (99.7), 104 (104.6), 115 (114.5), 117 (117.1), 123 (122), 132 (132).

Since this is the most feasible accurate method for general clinical use, it seems desirable to give the details of the method.

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* The Newcomer results were calculated by us to the same basis as the first four methods, i.e., blood containing 13.8 gm. hb. per 100 c.c. being considered as having 100 per cent hemoglobin.

Technic. Put dilute HCl in the graduated tube about to the 10 mark. Deliver exactly 0.02 c.c. of blood with the Sahli pipette as quickly as possible into the solution and mix at once. See that there are no clots. Draw solution into the pipette twice, blowing it out into the tube, then rinse the tip with a drop of the HCl. Warm the tube in a beaker of hot water (55-60°) for seven minutes. In that length of time the full acid hematin color is developed (one hour at room temperature did not prove to be as effective as some investigators claim). Cool the tube and dilute the mixture gradually with careful mixing until it matches the standard. Make the reading from the graduated tube.

Note the temperature of the room in the vicinity of the standard. If it is 20° C. no correction is necessary, but for each degree above 20 add one-hundredth part of the Sahli reading, and for each degree below 20 deduct one-hundredth part. For example, with the standard at 22° an estimation reads 81 per cent, corrected it becomes 82.6 per cent.

When research accuracy is desired, bring the standard to the proper temperature by immersing the tube in a beaker of water at 20° before making the final matching. Rise in temperature darkens the color of the standard slightly by increasing the hydrolytic dissociation of the ferric sulphate in the standard. Lowering the temperature makes the standard slightly paler.

Notes. (1) Approximately 0.2 N hydrochloric acid is used. This can be made by diluting 9 c.c. of C. P. HCl to 500 c.c.

(2) Paired graduated and standard tubes (of the same inside diameter) can now be secured from the dealer,* also the Sahli pipette tested against the graduated tube (so that when the blood delivered by the pipette is diluted to 100 volumes, it will come to the 100 mark of the graduated tube).

Since there are several different ideas current as to what should be considered 100 per cent Hb., it is advisable to report hemoglobin estimations as grams per 100 c.c. Our table for conversion to grams can be used for all methods based on 13.8 gm. as 100 per cent (methods 1, 2, 3, 4, 6b, and 7).

7. When many estimations are to be made in one day, venous blood being available (as in a hospital or clinic), a very useful method is that of Osgood and Haskins.[9] This is a modification of method 2, using a permanent standard.† Estimations by this method agree very closely with those by Van Slyke's method (results by the latter method are given in parentheses), e.g., 29.7 (30.6), 43.7 (42.9), 49.7 (49), 65.7 (66), 80.4 (79.8), 90.8 (91.9), 100.5 (100), 117.3 (116.8), 131.3 (132.2).

EQUIVALENT OF PER CENT HEMOGLOBIN TO GRAMS PER 100 CC. OF BLOOD

(100% = 13.8 gm. per 100 cc.)

%	gm.	%	gm.	%	gm.	%	gm.
15	2.07	50	6.90	85	11.73	120	16.56
16	2 21	51	7.04	86	11.87	121	16.70
17	2.35	52	7.18	87	12.01	122	16.84
18	2.48	53	7.31	88	12.14	123	16.97
19	2.62	54	7.45	89	12.28	124	17.11
20	2.76	55	7.59	90	12 42	125	17.25
21	2.90	56	7.73	91	12.56	126	17.39
22	3.04	57	7.87	92	12.70	127	17.53
23	3.17	58	8.00	93	12.83	128	17.66
24	3.31	59	8 14	94	12.97	129	17.80
25	3.45	60	8.28	95	13.11	130	17.94
26	3.59	61	8 42	96	13.25	131	18.08
27	3.73	62	8.56	97	13.39	132	18.22
28	3.86	63	8.69	98	13.52	133	18.35
29	4.00	64	8.83	99	13.66	134	18 49
30	4.14	65	8.97	100	13.80	135	18.63
31	4.28	66	9.11	101	13.94	136	18.77
32	4.42	67	9.25	102	14.08	137	18.91
33	4.55	68	9.38	103	14.21	138	19.04
34	4.69	69	9.52	104	14.35	139	19.18
35	4.83	70	9.66	105	14 49	140	19.32
36	4.97	71	9.80	106	14.63	141	19.46
37	5.11	72	9.94	107	14.77	142	19.60
38	5.24	73	10.07	108	14.90	143	19.73
39	5.38	74	10.21	109	15.04	144	19.87
40	5.52	75	10 35	110	15.18	145	20.01
41	5.66	76	10.49	111	15.32	146	20.15
42	5.80	77	10.63	112	15.46	147	20.29
43	5.93	78	10.76	113	15.59	148	20.42
44	6.07	79	10.90	114	15.73	149	20 56
45	6.21	80	11.04	115	15.87	150	20.70
46	6 35	81	11.18	116	16.01	151	20.84
47	6.49	82	11.32	117	16.15	152	20.98
48	6.62	83	11.45	118	16.28	153	21.12
49	6.76	84	11.59	119	16.42	154	21.26

Technic. Measure exactly 1 c.c. of well mixed oxalated blood into a 100 c.c. flask, containing about 40 c.c. of water. After laking has occurred add 50 c.c. of 0.2 N acid (see above) while mixing and dilute to the mark. To cut foam use a drop of alcohol (not caprylic). Mix well, heat part of the solution in a test tube as in the Haskins-Sahli method and cool. Estimate with a colorimeter, setting the standard solution at 15 mm. Make several readings being careful to avoid eye-strain. Take the temperature of the standard at once by inserting a thermometer in the liquid. No calculation is necessary, since the percentage of hemoglobin can be read directly from the table (furnished with the standard), using the temperature and the average mm. reading. The per cent can then be converted into grams per 100 c.c. by referring to the table (above).

Notes. (1) As in all colorimetric methods, the colorimeter must be set before making readings, so that there is uniformity of light on both sides. We have found the Kober (having two mirrors) and the new Klett (having a light in the base) colorimeters the easiest to set.

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* These may be secured from the Shaw Supply Co. of Portland, Ore.

† As above.

(2) Preservation of the standard. Keep it in a Non-sol or Pyrex flask, corked with a rubber stopper (if a new stopper is used, scour it well). The standard after being used is stored in a second flask. Before the main stock is exhausted check up the used standard against it by making estimations with both, using the same acid hematin preparation. If they agree, pour the used standard into the other flask and use again. We have found that with reasonable care no change in the solution is noticed during months of repeated use.

SUMMARY

1. Eight hemoglobin methods in current use have been given critical consideration.

2. All of the popular clinical methods (numbered above as 3, 4, 5 and 6a) yield inaccurate results in a certain number of cases, so that one can never be sure in the case of any particular blood of having secured a satisfactory estimation. Obviously the results by such methods should not be used for calculation of color index.

3. The Haskins-Sahli method and the Osgood-Haskins colorimeter method are feasible as clinical methods and can be depended on for accuracy. In the case of both, the technic is easy and the standards are permanent and inexpensive.

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Prophylactic Value of Blood of Convalescents in Measles. One hundred and seventy-four children were injected by Sidney V. Haas and Julius Blum, New York (*Journal A. M. A.*, Aug. 21, 1926), with plasma of convalescents, varying in age from 1 to 4 months after defervescence at the time of collection and stored for from one-half to four and one-half months before injection. Considering the plasma collectively, 78 per cent of all the children were protected for three weeks, and 51 per cent were protected for three months or more. Plasma of convalescents, collected one and three months after defervescence, protected 89 per cent for three weeks. There was very little difference in the protective value of plasma from patients who were convalescent four months at the time of collection, whether it was 1 or 4½ months old at the time of injection. The earlier the plasma is collected after defervescence, the greater is its protection value. Eighty-eight of a total of 174 children injected with plasma from patients convalescent from one to four months, and stored from one-half to four and one-half months before injection, contracted a mild modified form of measles. It is interesting to note that there were sufficient antibodies in the plasma to modify the measles, even when it developed as late as three months after injection. In the modified form of the disease, Koplik's spots were occasionally absent, whereas the conjunctivitis and coryza were either very mild or frequently absent. The eruption was light colored and discrete, the papules the size of the head of a pin and less extensive over the extremities. There was a rise in temperature to from 100 to 102, with defervescence and disappearance of the rash within from twenty-four to thirty-six hours. None of the children who had a modified measles appeared to be ill, so much so that it was impossible to keep them in bed at the end of twenty-four hours. Quite a few children, on account of recurrent attacks of bronchopneumonia and gastrointestinal disturbances, were underweight, anemic and generally below par before they developed a modified measles. These children convalesced from their measles without any untoward result. Including all plasma that was used, irrespective of its age at collection or at the time of injection, there is very little difference in protective value, when given from the fourth to the seventh day of exposure to the disease.

Treatment of Peripheral Vascular Disturbances of Extremities. The treatment of Raynaud's disease, erythromelalgia, organic vascular disease and endarteritis obliterans, as carried out in the Mayo Clinic, is described by George E. Brown, Rochester, Minn. (*Journal A. M. A.*, Aug. 7, 1926). Medical treatment of Raynaud's disease and allied vasospastic disturbances has not been successful, and theoretical considerations would indicate a surgical procedure that would produce interference with the vasomotor paths to the extremities. Perivascular stripping was not followed by a demonstrable increase in the blood flow of the extremity. Removal of the second, third and fourth lumbar sympathetic ganglions, and perivascular neurectomy of the common iliac arteries produces this effect in the lower extremities. Probably a permanent vascular dilatation in the feet ensues, with disappearance of the vasoconstricting action. The blood flow is markedly increased, as shown by quantitative studies of the loss of heat and the surface temperature. Trophic ulcers heal rapidly, and signs and symptoms of the disease disappear completely. In thromboangiitis obliterans the relief of pain is frequently the paramount consideration, and its relief, for variable periods, can be accomplished in many cases by the intravenous injection of foreign protein or of radium chloride and irradiation of the sacral spine with roentgen rays. In the absence of definite gangrene and when relief from pain is attainable, these patients can be tided over long periods with some hope of circulatory compensation being established. Conservative measures to avoid amputation are necessary, as the disease is bilateral, and double amputation spells economic disaster for these unfortunate men in the active time of life. Early diagnosis is essential. Unfortunately, this disease is not well recognized by physicians generally, as less than 20 per cent of these cases were corerctly diagnosed before their investigation at the clinic. Much valuable time was lost during the period when protective and simple physical measures might have prevented the serious sequelae of this disease. When these patients show beginning trophic disturbances and the usual distressing pain, the operation, as performed by Adson, seems to offer additional chance of preventing the loss of limbs.

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EDITORIAL

MORE NARCOTIC HARASSING OF THE DOCTOR

Ever since the Harrison Narcotic Act was passed in 1914, it has been a thorn in the flesh of the average physician. Its interpretation was long difficult of understanding, and its administration has been attended with endless conflict and annoyance to the profession. It has seemed at times as if the Revenue Bureau was intent on making the life of the physician as miserable as possible, who in any way was connected with prescribing or dispensing narcotics. There have been notorious instances where officials have actually laid plans to trap the physician into the violation of this law, greatly to his chagrin and at times unjustified conviction. The recent decisions of the United States Supreme Court, declaring some of these regulations unconstitutional, were thought to free the physician from certain burdensome and unjust restrictions.

It seems that this freedom will be short lived and the condition of servitude will be more onerous than ever, if the Smoot Bill (S. B. 4085) should be enacted at the next session of Congress, which was introduced last April. The White Cross has given publicity to the situation. As indicated by its title, its purpose is "to strengthen the Harrison Narcotic Act of 1914, as amended, and for other purposes." After introducing various amendments of minor importance, the meat of the coconut is found in a new provision in Section 2 of the original bill. The latter states that nothing contained in this section shall apply "to the dispensing or distribution of any of the aforesaid drugs to a patient by a physician, dentist, or veterinary surgeon registered under this Act in the course of his professional practice only." Then is introduced the following significant clause: "Provided, that no dispensing or distribution of the aforesaid drugs pursuant to the so-called ambulatory treatment for narcotic-drug addiction shall be construed to be in the course of his professional practice only." In other words, no physician shall be permitted to dispense or distribute narcotic drugs to any ambulatory addict under the penalty of fine and imprisonment. The full meaning and ultimate result of this provision should sink into the mind of every man and woman practicing medicine. When Senator Smoot was asked why he introduced this measure, he replied that he knew nothing of its contents but did so in compliance with a request from the Revenue Bureau. The question naturally arises what interests demand that the physician shall be prohibited from providing narcotics for the ambulatory addict. Is it intended that these patients shall be treated only in institutions? Heaven forbid the thought that it proposes to grant such privilege to the dope peddler which is forbidden to the physician. One might even imagine that such a condition could exist under this regulation.

The whole subject of drug addiction in this country is commonly treated in an inhuman manner, totally different from the British conception of the situation. Instead of looking upon the addict as an unfortunate member of society, whose condition should be tolerated and improved or relieved as much as possible, he is considered an outcast and frequently receives but slight attention of any sort. Most authorities on drug addiction look upon the morphine habitue as incurable. He may be graduated as a shining example from one of the noted institutions for this line of treatment, but in course of time will probably relapse to his former state. In Great Britain this condition is handled from a more rational and humane standpoint. Two years ago the Ministry of Health* appointed a departmental committee on morphine and heroin addiction, whose chairman was Sir Humphry D. Rolleston, President of the Royal College of Physicians and Surgeons, "to consider and advise as to the circumstances under which the supply of morphine and heroin to persons suffering from addiction to these drugs may be regarded as medically advisable." This committee submitted its report last January, in which it is stated that the importance of hospital treatment is not questioned, but the Board found numerous drug users for whom no hospital accommodations existed. They claimed there are numerous drug addicts in all walks of life who "are capable of living fairly normal and useful lives as long as they take a certain nonprogressive quantity, usually small, but who cease to be able to do so when the regular allowance is withdrawn." Furthermore, they stated there are persons in whom a complete cure cannot be expected, for whom it is justifiable in certain cases to order the regular minimum dose which has been found necessary to avoid serious symptoms, or to keep the patient in a condition in which he can lead a useful life. On nearly every page of this report the capability for such a useful and relatively normal life is recognized and emphasized.

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* Departmental Committee Report Morphine and Heroin Addiction. Ministry of Health, London, 1926.

This report, expressing the deliberate judgment of one of the most eminent bodies in the world, is a vindication of those American physicians who have dared to assert their prerogatives in the practice of medicine. Why should a Bureau of nonmedical men have the authority to regulate and restrict the treatment of diseased individuals, regardless of the opinions of men educated in the study and treatment of such conditions? No other profession in this country is thus harassed and restricted in the exercise of their professional requirements. It is probable that this last imposition in the practice of medicine will be enacted into law when Congress meets in its winter session, unless the medical profession unitedly protests and takes such action as will block this legislation and substitute some reasonable and just methods of meeting this situation.

LOCATIONS FOR NEW PRACTITIONERS

Nearly every individual practicing medicine has passed through the experience at the beginning of his professional career, of worry and anxiety as to the best place to begin his life work in the medical field. Many have changed from one location to another, hoping thereby to better their condition. Often one continues in a certain locality during years of unhappiness and dissatisfaction, believing that he made a great error at the outset in the selection of his field of practice. If suitable bureaus were established in different parts of the country as clearing houses for young medical practitioners, this might result in great advantage to the individual doctor and the residents of many communities. To the novitiate in medical practice it commonly appears that every field is overcrowded with established practitioners, while in reality there may be nearby certain openings that might prove remunerative and agreeable for permanent residence.

This situation might be relieved in certain localities by following the example of King County Medical Society, which has recently established in Seattle a Location and Advisory Committee, the primary object of which is to intelligently advise new arrivals in the medical fraternity and help them become located. It is common for officers of medical societies, chambers of commerce and the like to receive requests from recent graduates for suitable locations. The editorial office of this journal is continually in receipt of such communications. By referring them to a committee such as the above it may be possible to bring together the seeking physician and the receptive locality. This committee will present to the inquiring physician a questionnaire concerning his social status, conditions of family, his specialty, previous experience, financial status, etc. A local function of the committee will be the provision of a voluntary panel of doctors willing to make night and emergency calls, administer anesthetics, and substitute for older physicians during absence from the city. The amplification of this service can readily be imagined in many fields of endeavor. It is believed that, after a committee of this nature has become an established factor in the life of the local society, its influence will be of decided benefit both to the new practitioner seeking fields of endeavor and the older established physician in the community.

NOMINATE DR. JONEZ

A legislator, hostile to the enactment of health laws and opposed to the advances of medical science, is a menace to the public welfare. Such a Representative is Albert Johnson of the fourth congressional district of Washington. During the six terms of his service in the House of Representatives he has been conspicuous as an obstructionist against measures presented to promote public health and has himself sponsored hostile legislation for the same purpose. An opportunity is now offered the voters of his district to replace him by a man, whose life work has been devoted to relief of suffering and the promotion of good health of the public. Dr. H. D. Jonez of Tacoma, who has practiced medicine for fifteen years in that city and is now serving as county health officer, is Johnson's opponent for the suffrage of the voters at the coming primary election. If the physicians of that district will exert their combined influence with their clientele in support of Dr. Jonez' candidacy, he will receive the nomination which will be equivalent to election in November. The medical profession of that section of the state could not reflict greater credit on itself than by aiding in accomplishing this result. Let everyone do his best for this purpose.

MEDICAL RESERVE CORPS VACANCIES

Several months ago attention was called in this journal to the necessity for more interest on the part of the medical profession of the Northwest in the Medical Reserve Corps, in order that the quotas might be filled in the different states. A recent communication from Colonel E. L. Munson, Headquarters Ninth Corps Area, states that the Montana enrollment is 100 per cent, the Oregon quota being about 91 per cent filled, but Washington and Idaho have so far furnished less than two-thirds of their quotas, still lacking 124 Medical Reserve officers.

At the recent meeting of the Montana State Association, at Billings, Dr. William J. Mayo, Brigadier General of the officers reserve corps, declared himself an ardent advocate of preparedness as the best insurance against war. He stated that 65 per cent of the staff of physicians and surgeons at the Mayo Clinic are reserve medical officers. In the future no physician or surgeon will be accepted on the staff of the Mayo hospital who is not a member of the officers reserve, if he is physically fit. The need of more physicians and surgeons to complete the Medical Corps is urgent at the present time, and the matter is again presented to the profession of the Northwest with the request that those able to meet this emergency will seriously consider the question of enlistment at an early date.

PUBLICATION OF SOCIETY REPORTS

Everyone appreciates the benefit accruing to the physicians of a community from a live and up-to-date medical society. If it produces programs of papers on live topics, demonstrating that its members are not dead but keenly awake to the medical progress of the day, it is a satisfaction to them as well as impressive on the profession of other localities to learn what they are doing and how results are accomplished. This desired publicity is available through the columns of the state association journal, one of whose functions is thus to serve the constituent local organizations. This journal is prepared to publish monthly such reports of the previous month's meetings as shall be received for that purpose. It is desirable that these communications be received on or before the twenty-fifth of the month in order to insure publication in the following month's issue. The journal management hopes to make this publication of real service along this line during the coming year.

MEDICAL NOTES

New Advertisements. Attention is called to the advertisement of Hotel Berkshire (page 22). This hotel is conveniently located for physicians visiting Chicago. The program of the Vancouver Medical Association Summer School will be found on page 8.

Pediatricians Elect Officers. At the semiannual meeting of the North Pacific Pediatric Society held in Victoria June 22, Dr. H. L. Moon and V. W. Spickard, of Seattle, were elected president and secretary-treasurer respectively for the ensuing year.

OREGON

The Doernbecher Memorial Hospital for Children, on Marquam hill, Portland, was officially opened July 30. Funds for its erection were provided by the will of the late F. S. Doernbecher and by donations from several Portland organizations and individuals. It is a six story, fire-proof structure with a capacity of 80 beds. Dr. J. B. Bilderback, professor of pediatrics in the University of Oregon medical school, is physician-in-chief of the hospital.

Astoria to have New Hospital. Work is soon to be started on a 90-bed, fireproof hospital in Astoria. It will be known as the Columbia Hospital and is being built by the Evangelical Lutheran Augustan Synod.

State Medical Officials Speak. At the meeting of the Coos-Curry Medical Society, held at Marshfield March 15, addresses were made by Dr. W. B. Morse, president of the Oregon Medical Society, Dr. Frederick D. Stricker, state health officer and secretary of the Oregon Medical Society, and Clyde P. Foley, executive secretary of the Oregon Public Health League.

Public Health Institute. Under the direction of the Marion County Child Health Demonstration, the University of Oregon medical school and the Oregon State Board of Health, an institute of physicians and nurses was held in Salem July 27-31. Various public health topics were discussed by Dr. W. F. Draper, assistant surgeon general of the United States Public Health Service, Miss Sarah J. Place, director of the Chicago Infant Welfare Society, and by local public health officials.

Dr. Robert Hemingway, formerly of Stillwater, Minn., has become associated with the Bend Clinic at Bend.

Dr. George Smith has returned to Pilot Rock to resume his practice.

Dr. Raymond Adkisson, a graduate of the University of Oregon medical school, has located for practice at The Dalles.

Medical Wedding. Dr. Louis P. Gambee and Miss Angela Canning of Portland were married July 24.

WASHINGTON

New Practitioners. At the July session of the State Medical Examining Board, held at Olympia, the following physicians were admitted to practice on examination: H. J. Greer, A. E. Lien, T. P. Ratigan, Saul Rubin, P. W. Spickard, J. W. Unis and Adolph Weinzirl of Seattle; R. E. Beneviste, Spokane; D. G. Dickinson, American Lake; M. P. Dorman, Tacoma; J. I. McFadden, Casland; H. .S Jessup, Ladysmith; R. S. Hamilton, Victoria, B. C.; Brook Horsky, Helena, Mont.; W. A. Kellogg, New York City; D. F. Murphy, Beverly, Mass.; C. E. Tran, Kamsack, Sask.

Those licensed to practice by reciprocity were as follows: W. I. Devers, F. H. Douglass, A. H. Grauman, V. S. McDaniel, J. A. Weber, Seattle; G. E. Griffith, Tacoma; R H. Rea and G. B. Story, South Tacoma; B. H. Adams, Bremerton; I. W. Birkeland, Scenic; C. M. Canning, Spokane; G. C. Daniel, Walla Walla; R. N. Hester, Chehalis; H. D. Lillibricge, Auburn; E. B. Loudin, Olympia; Mary E. Morgan, Bellingham; W. P. Cornelius, Montesano; L. G. Steck, Ryderwood; H. M. Weber, Berne; Joel Anderson, Gothenburg, Neb.; Portus Baxter, Libby, Mont.; R. W. Furman, Glendive, Mont.; T. A. Hedemark, St. Paul, Minn.; G. W. Knox, Sioux City, Iowa; G. R. Lunger, San Francisco; Jacob Seuberth, Woodlake, Calif.

Scores Faith Healers. At the meeting of the Associated Safety Engineers held at Spokane recently, Dr. W. J. Howells urged that a law be enacted, giving the compensation division of the state department of labor and industry the right to refuse faith healing in cases coming under its direction. Dr. Howells stated that each year many injured workmen loose their lives by following the advice of faith healers, and thus delaying necessary surgical and medical treatment.

New Hospital Needed. The need of more facilities in Seattle and King County has been recently emphasized by Dr. W. H. Anderson, superintendent of the County hospital. There are now 209 patients under treatment in this institution which is thirty-six more than its normal capacity. Construction of a combined city and county hospital at a cost of $1,125,000 is recommended as a present necessity. The city owns an ideal tract of land on Beacon Hill which has frequently been designated as a site for such an institution. Eventually such construction must be authorized.

Renominated for Congress. Dr. John B. Summers of Walla Walla is unopposed as candidate for Congress on the republican ticket of his district, which is equivalent to nomination at the primary election. As this district is consistently republican, he will again be returned to Congress. This is an indication of the esteem in which he is held by his fellow citizens. We extend to him our congratulations.

Veterans Honor Physician. Dr. O. R. Austin, of Aberdeen, has been elected commander of the Washington department of the United States Spanish War Veterans.

New Health Officer. Dr. Miles Hopkins has been appointed temporary health officer for Walla Walla county.

Dr. F. G. Munson, of Wapato, has recovered from a recent serious illness.

Dr. John Corkery, of Spokane, recently suffered a severe infection which necessitated operative interference.

Returns to Practice. Dr. F. E. Dent has returned to Sequim to resume his former practice.

Dr. Arthur E. Lien, formerly of the Seattle Swedish Hospital, has opened an office at Omak.

Dr. J. G. Lovell, of Omak, has moved to Spokane, where he will engage in practice.

Dr. James McFadden has begun practice at Casland.

Dr. Ralph Sterret, who for the past two years has been located in the Hawaiian Islands, has arrived at Yakima to engage in practice.

Dr. Bertram Zener has joined his father, Dr. C. R. Zener, in practice at White Salmon.

Medical Wedding. Dr. Joseph A. McKee, of Seattle, was married August 9 to Miss Olive Mary Greer of Vancouver, B. C.

IDAHO

Chicago Doctors Speak. At a meeting of the Pocatello Medical Society, July 25, Dr. Allen Kanavel and Dr. Charles B. Elliot, of Northwestern University medical school, addressed the members on the subject of goiter.

Appointed to Resident Staff. Dr. A. F. Martin, a graduate of the University of Oregon medical school, and Dr. Shimkawa, of the University of Iowa school of medicine, have commenced internships in the L. D. S. Hospital at Idaho Falls.

Dr. Russell Truitt, who formerly practiced at Reubens, has moved to Southwick. Dr. Truitt practiced in Southwick a number of years ago.

Dr. J. W. Swenson has located for practice at Twin Falls.

Medical Wedding. Dr. Howard Rouse and Miss Clara Archibald of Lewiston were married August 5.

MONTANA

State Association Elects Officers. At the recent annual meeting of the medical association of Montana the following officers were elected for 1926-27: President, Dr. T. F. Attix, Lewistown; president-elect, Dr. George M. Jennings, Missoula; vice-president, Dr. S. K. Campbell, Harlowton; sercetary-treasurer, Dr. E. G. Balsam, Billings. Missoula was selected as the place for the next annual meeting.

Dr. T. F. Walker, city-county health officer of Great Falls, was elected president of the Montana State Public Health Association at its annual meeting held at Billings in July.

Spotted Fever Statistics. At the close of the annual spotted fever season in Montana, there had been reported twenty-five cases with ten deaths. The total number of cases was less than usual but the mortality rate of forty per cent was higher than in recent years.

Dr. T. W. Ewart, of Harlem, has disposed of his practice to Dr. H. S. Holmes of Opheim. Dr. Ewart will move to California

OBITUARIES

Dr. Robert D. Alton died at Portland, Ore., July 30, aged 66 years, following a cerebral hemorrhage. He was born at Carbondale, Pa., in 1860 and graduated from Western Reserve University medical school in 1881. He located at Livingston, Mont., where he served as division surgeon of the Northern Pacific Railway until 1922, when he moved to Portland. He was an instructor at the University of Oregon medical school.

Dr. H. C. Bump, of Kendrick, Ida., died at the Providence Hospital, Seattle, July 12, aged 88 years. He was born at Princeville, Ill., in 1838 and graduated from the University of Buffalo medical school in 1873. He practiced at Spokane, Wash., until 1921, when he retired and moved to Kendrick.

Dr. Johnson Armstrong, a pioneer physician of Tacoma, Wash., died at his home August 12, aged 74. He was born at Bellsville, Ohio, in 1852 and graduated from Rush Medical College in 1880. He was engaged in practice at Tacoma from 1882 to 1911, when he retired.

Dr. Robert L. Owens, of Missoula, Mont., died August 10 at a local hospital following an operation. He was born in 1885. After graduating from the American Medical Missionary College in 1907, he engaged in practice at Hamilton, Mont. He served as a major in the medical corps during the world war. At the end of the war he moved to Missoula.

MEDICAL RESERVE CORPS

MEDICAL RESERVE OFFICERS

ATTENDING COURSE OF INSTRUCTION AT FORT MC DOWELL, CALIF., SEPT. 12 TO 26, 1926, WITH DATE OF COMMISSION

Colonel Marius B. Marcellus, 615 East Broadway, Portland, Oregon, June 19, 1924.

Colonel Edward A. Rich, 1217 Rust Bldg., Tacoma, Washington, April 10, 1925.

Lieut. Colonel John J. Sellwood, 1964 E. 13th St., Portland, Oregon, November 30, 1923.

Lieut. Colonel Ferdinand H. Dammasch, 292 E. 22nd St., Portland, Oregon, November 4, 1924.

Major William R. Morrison, 235 Hart-Albin Bldg., Billings, Montana, April 2, 1926.

Major Ferris L. Arnold, 216 Clark Ave., Billings, Montana, May 7, 1926.

The following changes of assignment status of members of the Reserve Corps are announced:

Lieut. Col. Thomas M. Joyce, Med-Res., Stevens Bldg., Portland, Oregon, relieved from assignment to General Hospital No. 46, Communications Zone, and reassigned to Station Hospital No. 143, Communications Zone, as Commanding Officer.

Capt. Hayes H. Culbertson, Med-Res., Forsyth, Montana, assigned to General Hospital No. 145, Zone of the Interior, as Surgical Ward Officer.

1st Lieut. Allan R. Foss, Med-Res., N. P. Hospital, Missoula, Montana, assigned to General Hospital No. 145, Zone of the Interior, as Medical Ward Officer.

By direction of the President, so much of paragraph 2, Special Orders No. 161, these headquarters, dated July 22, 1926, as orders Colonel James Beaty Eagleson, O-134511, Medical Department Reserve, 902 Boren Avenue, Seattle, Washington, to active duty, effective September 12, 1926, is hereby revoked.

MEDICAL DIRECTORY

The first directory of Reserve Officers has just been published, the "List and Directory of Medical Department Reserve Officers, U. S. Army, Ninth Corps Area." This roster of names discloses the high class of men who have enrolled for patriotic service in any national emergency. A total of 2170 names are included, of which 1216 are Medical Reserve Officers. They are arranged alphabetically under the different states comprising the Ninth Corps Area. There is included a roster of units, containing important data. This publication will be of interest to all actual and prospective members of the Reserve Corps.

PUBLIC HEALTH LEAGUES

VIVISECTION AN ISSUE

In the third congressional district of Washington the vivisection issue has become one of importance in the primary. The present congressman from the district, Albert Johnson, is opposed by Dr. Hinton D. Jonez of Tacoma which gives added interest to the health features of the campaign. Johnson has an anti-health record, while Jonez is health officer of Pierce County.

The Johnson attitude on health is shown by an antivivisection bill which he introduced in Congress, denying the right to government officials in the army and navy to conduct experiments along the lines of animal research in connection with dangerous gases, etc. In this way Mr. Johnson would stop research designed to aid in the national defense. The experimentation would, therefore, have to take place on the battlefield with American soldiers used instead of guinea pigs, rabbits and other laboratory animals. Fortunately the Johnson bill did not make much progress. Mr. Johnson is also a vice-president of the Antivivisection Society of Washington.

The League officials have felt it necessary to issue bulletins in this campaign favorable to Dr. Jonez, with a health issue of this importance at stake. Federal as well as state legislation dangerous to the public health will be vigorously opposed and candidates wrong on such vital issues will have their views and votes brought to attention. This activity in the election of a national officer represents a new departure in League operations.

BASIC SCIENCE UP AGAIN

The Basic Science Bill, calling for an ABC examination in the fundamental subjects of healing for practitioners, is being discussed in the various legislative districts of the state during the present campaign. Indications are that it will have enlarged legislative support at the next session. It lacked only three votes of being passed over the veto last January.

Another measure to be pressed at the next session is the so-called "law enforcement" bill. This measure gives over the enforcement of the professional acts to the attorney general, and provides money for a special department from renewal fees from physicians, dentists, pharmacists and other groups.

Washington's health problems are largely those of law enforcement, and it is believed that this measure will establish effective law enforcement machinery. The bill passed both houses at the last session by overwhelming majorities. It was vetoed by Governor Hartley. The dentists and pharmacists are working with the medical profession, through the League, with the result that the health influence in the primaries September 14 will be a pronounced factor.

REPORTS OF SOCIETY MEETINGS

MEDICAL ASSOCIATION OF MONTANA

MINUTES OF THE FORTY-EIGHTH ANNUAL MEETING OF MEDICAL ASSOCIATION OF MONTANA, COMMERCIAL CLUB BUILDING, BILLINGS, MONT., JULY 16-17, 1926.

Friday, July 16

MEETINGS OF HOUSE OF DELEGATES

An informal meeting was called Friday noon so that the Delegates could present credentials, C. F. Watkins, President in the chair. After inspection of credentials the following answered roll call—Big Horn: G. A. Baker. Cascade: C. C. Albright, L. Southmayd, T. F. Walker, E. D. Hitchcock. Eastern Montana Medical Society: J. H. Garberson, W. H. Blakemore. Fergus: J. G. Parsons, E. F. Ross. Hill: W. F. Hamilton. Lewis and Clark: S. A. Cooney, B. C. Brooke. Western Montana Medical Society: A. R. Foss, E. G. Wilcox, G. M. Jennings. Musselshell: C. T. Pigot. Park: L. H. Huber. Silver Bow: R. C. Monahan, A. W. Morse, H. Schwartz, J. C. Shields, J. A. Donovan. Yellowstone: J. D. Barrett, H. E. Armstrong, A. E. Stripp. Councilor E. M. Gans. Past-President W. F. Cogswell. There being no contests, and a quorum present, the House of Delegates was declared properly organized for business. The President announced that he would appoint the committees, and the meeting would adjourn until 5:30 p. m.

The regular business meeting of the House of Delegates was called to order by President C. F. Watkins at 5:30 p. m. Roll call was as follows—Big Horn: G. A. Baker. Cascade: C. C. Albright, L. Southmayd, T. F. Walker, E. D. Hitchcock. E. M. M. S.: J. H. Garberson, W. H. Blakemore. Fergus: J. G. Parsons. Hill: W. F. Hamilton. Lewis and Clark: B. C. Brooke, S. A. Cooney. W. M. M. S.: A. R. Foss, E. G. Wilcox, G. M. Jennings. Musselshell: C. T. Pigot. Park: L. H. Huber. Silver Bow: R. C. Monahan, A. W. Morse, H. Schwartz, J. C. Shields, J. A. Donovan. Yellowstone: A. E. Stripp. President-Elect F. F. Attix, Councilors E. M. Gans, W. W. Taylor. Past-President W. F. Cogswell, and Earl Whedon, Secretary of the Wyoming State Medical Society.

The committee considering the place for the next meeting, composed of Drs. Cooney, Jennings and Monahan, reported they were in favor of Missoula. Dr. Shields moved the adoption of the report. Seconded by Dr. Brooke. Remarks were made by Dr. Southmayd who invited the Association to Great Falls. Dr. Albright said that the Academy of Oto-Ophthalmology was to meet in Missoula. Dr. Foss invited the Association to Missoula. The motion was put and carried unanimously.

The committee making nominations for the State Board of Health, composed of Drs. Baker, Donovan and Huber, submitted the following names: L. H. Fligman, E. D. Hitchcock, H. V. Wilking, A. R. Varco and M. D. Hoyt. Dr. Morse moved the report be adopted, seconded by Dr. Hamilton, carried.

The Auditing committee, composed of Drs. Gans, Brooke and Hamilton, after examining the financial report of the Secretary-Treasurer found it correct and Dr. Gans moved its adoption, seconded by Dr. Brooke, carried.

The committee for considering a joint meeting with Wyoming and Idaho State Societies in Yellowstone Park in 1928, composed of Drs. Garberson, Shields and Stripp, reported in favor of the idea. Dr. Monahan moved the adoption of the report, seconded by Dr. Shields, carried. Dr. Monahan moved that the President appoint a committee to handle our part of the plan. The President appointed Dr. Attix and Dr. Balsam.

Dr. Walker presented the following resolution:

WHEREAS, Rabies is apparently increasing in the United States, and

WHEREAS, It is the opinion of many of the Health Officers that one cause for the increase is the fact that many of the auto tourists take their dogs with them when traveling from one state to another, often from infected areas, and

WHEREAS, It is almost impossible for the states to carry out any law restricting this traffic in dogs, and

WHEREAS, In the case of the states of Montana and Wyoming, nearly all out-of-state auto tourists visit one of our National Parks, therefore, be it

RESOLVED, That the Medical Association of Montana does hereby request the U. S. Department of the Interior to make regulations prohibiting dogs from National Parks, believing that each Park is equipped with the proper machinery for the enforcement of such a regulation.

Dr. Southmayd moved the adoption of the resolution. Seconded by Dr. Hitchcock. Carried.

Dr. Gans moved the meeting adjourn till Saturday noon. Seconded by Dr. Huber. Carried.

A regular business meeting of the House of Delegates was called to order Friday, July 17, at noon by the President, C. F. Watkins. Roll call was as follows—Big Horn: G. A. Baker. Carbon: C. E. Beltzer.

Cascade: C. C. Albright, L. Southmayd, T. F. Walker, E. D. Hitchcock. E. M. M. S.: J. H. Garberson. Gallatin: S. K. Campbell. Hill: W. F. Hamilton. Lewis and Clark: B. C. Brooke, S. A. Cooney. W. M. M. S.: A. R. Foss, E .G. Wilcox, G. M. Jennings. Musselshell: C. T. Pigot. Park: L. H. Huber. Silver Bow: R. C. Monahan, A. W. Morse, H. Schwartz, J. C. Shields, J. A. Donovan. Yellowstone: A. E. Stripp. President-Elect F. F. Attix. Councilors: E. M. Gans, A. W. Deal, W. W. Taylor, J. A. Evert.

The Delegate, C. T. Pigot, gave his report of the Dallas meeting. Dr. Beltzer moved the adoption of the report. Seconded by Dr. Monahan. Carried.

The question of continuing our relations with Northwest Medicine was introduced. The Delegates from Silver Bow, having been instructed to vote against our present arrangement, Dr. Donovan moved that our agreement with Northwest Medicine be ended Jan. 1, 1927. Seconded by Dr. Southmayd. Remarks were made by Drs. Foss, Garberson, Evert, Hitchcock, Pigot, Taylor, Southmayd, Cooney, Balsam, Watkins. Stripp. Carried.

Dr. Southmayd moved that the Association publish its own bulletin for a year. Seconded by Dr. Cooney. Votes 14 to 10. Carried.

Dr. Watkins called the attention of the meeting to the better feeling that exists among the doctors today; the progress in medical economics and the efficient service of the Secretary and suggested that the salary be raised. Dr. Donovan moved that the Secretary be paid $300.00 annually. Seconded by Dr. Huber. Carried.

Dr. Monahan moved that the members of the Medical Association of Montana render statements for their professional services on their own bill heads. Seconded by Dr. Cooney. Carried.

Dr. Pigot moved that we adopt the report of the Committee on Medical Relief in Disaster, presented to the A. M. A. House of Delegates at Dallas. Seconded by Dr. Garberson. Carried.

Dr. Deal moved that the Legislative Committee examine carefully the next Legislature, having in mind the advisability of changing our Medical Practice Act. Remarks were made by Drs. Hitchcock, Southmayd, Watkins, Garberson, Pigot, Donovan, Cooney. Carried.

Dr. Brooke moved that the annual election be held in the General Assembly. Seconded by Dr. Southmayd. Carried.

Dr. Cooney moved that the members of this Association employed by the railroads band together and request transportation for members of their families. Seconded by Dr. Monahan. Carried.

Dr. Beltzer moved the meeting adjourn. Seconded by Dr. Deal. Carried.

E. G. Balsam,
Secretary-Treasurer.

SCIENTIFIC PROGRAM

The first session was called to order by President C. F. Watkins of Billings at 9:30 a. m. Friday, July 16, 1926. E. W. Thuerer, President of the Yellowstone Valley Medical Society, welcomed the Association and its guests to Billings. Dr. F. F. Attix, President-Elect, made the response for the Association. The minutes of the last meeting were read by the Secretary and approved. The President called Vice-President E. D. Hitchcock of Great Falls to the chair and gave his annual message.

Dr. F. L. Arnold of Billings, representing the commanding officer of this area, told of the Medical Reserve and urged those who were interested to see him about joining.

Mrs. Rozsa, of the Prohibition Department, told of the changes in the regulations.

Dr. C. F. Coulter of Great Falls presented "The Relation of Pathology of the Antrum to Metastatic Infection." This subject was discussed by Drs. Tom Walker, J. G. Parsons and Coulter.

Dr. A. W. Morse of Butte told about "Electro Magnet Extraction of Foreign Bodies from the Eye."

Dr. C. C. Albright of Great Falls read a paper on "What We Should Know about Glaucoma."

J. X. Newman, Ph. D., of Helena, presented "Vincent's Angina as a Public Health Problem." Tom Walker of Great Falls made a few remarks on this topic.

The meeting adjourned. Luncheon was served in St. Vincent's Hospital by the Sisters of Charity, and an opportunity for inspection of the building was given the visitors.

The session was resumed at 2:15 p. m., being called to order by the President.

Dr. C. E. K. Vidal of Galen told of the "Montana Hospital for Tuberculosis." He gave its present condition and its needs.

Dr. M. D. Winter of Miles City read his paper on "Some Considerations in Diagnosis of Gallbladder Disease."

Dr. Fred Rodda of Minneapolis presented "Upper Respiratory Infection in Infancy and Childhood."

Dr. J. C. Shields of Butte read the formula of the media used by Dr. M. J. Scott in the preparation of his cancer cure.

Dr. Morris Fishbein of Chicago, Editor of the Journal A. M. A., gave his address on "Twenty-five Years of Medical Progress." He also told of his contact with the Scott cancer cure and said that he did not think much of it, as it had never been submitted to a group of scientists for investigation.

Dr. T. C. Witherspoon of Butte gave his ideas of "Gallbladder Disease."

Meeting adjourned.

In the evening at 6:30 the annual banquet was held at the Northern Hotel. Dr. T. C. Witherspoon was toastmaster and talks were made by Drs. C. F. Watkins, F. F. Attix, E. D. Hitchcock, W. J. Mayo, J. A. Farrell, Henry Schmitz, M. M. Seymour, D. C. Lochead, Earl Whedon, Fred Rodda, Morris Fishbein, E. M. Gans, and others.

Saturday, July 17

The session was called to order Saturday morning by the President at 9:35.

Dr. J. R. E. Sievers of Butte read a paper on "The Aspect of Medicine from the Standpoint of Science and the Layman."

Dr. W. J. Mayo of Rochester addressed the Association on "The Outlook in Cancer."

Dr. Fred Adair of Minneapolis presented "Interrelationship Between Pathologic Conditions of the Mother and Offspring."

Dr. Henry Schmitz of Chicago gave an illustrated talk on "Profuse Menstruation."

Meeting adjourned for lunch.

The President called the session to order at 2 p. m.

Dr. R. C. Coffey of Portland gave an illustrated lecture on "Results of Surgical Treatment of Gastro-Duodenal Ulcers." Dr. Mayo made a few remarks.

Dr. J. A. Evert of Glendive presented "Compound Fracture Treatment Methods." Remarks were made by Drs. Attix, W. L. Bishop of Portland, Earl Whedon of Sheridan.

Dr. F. T. Leddy of Rochester read the paper of A. U. Des Jardins on "Radiotherapy and the General Practitioner." An intermission of ten minutes was taken and the meeting was called to order for the transaction of business and the election.

The Secretary-Treasurer read the annual statement. The announcement was made that the contract with Northwest Medicine would expire at the end of 1926. The place for the next meeting is Missoula.

Election of officers was the next business.

President-Elect. Geo. M. Jennings of Missoula was nominated by Dr. Foss. Dr. E. M. Gans of Judith Gap moved that the nominations be closed and that the Secretary be instructed to cast the unanimous ballot of the Association for Dr. Jennings. Seconded by Dr. Wilcox. Carried.

Vice-President. S. K. Campbell of Harlowton was nominated by Dr. Gans. Dr. G. A. Baker moved that the nominations be closed and that the Secretary be instructed to cast the unanimous ballot of the Association for Dr. Campbell. Seconded by Dr. Varco. Carried.

Secretary-Treasurer. E. G. Balsam of Billings was renominated by Dr. C. E. Beltzer of Washoe. Dr. Huber moved that the nominations be closed and that the President be instructed to cast the unanimous ballot of the Association for Dr. Balsam. Seconded by Dr. Graham. Carried.

Councilors. Dr. J. C. F. Siegfriedt of Bear Creek nominated Dr. J. A. Evert of Glendive to fill the unexpired term of Dr. R. H. Beach who is now located in Tacoma; Dr. B. C. Brooke of Helena, Dr. R. L. Owens of Missoula, Dr. J. C. Shields of Butte, and Dr. W. W. Taylor of Whitefish for terms of three years each. Dr. S. E. Leard of Livingston moved the nominations be closed and that the Secretary be instructed to cast the unanimous ballot of the Association for those as Councilors. Seconded by Dr. A. W. Deal. Carried.

President Watkins thanked the guests for their papers and participation in the program which helped greatly to make the program such a success and hoped that they would each attend our annual sessions whenever possible. He also thanked the members for their cooperation during his term of office. Then he called upon Drs. Leard and Siegfriedt to conduct Drs. F. F. Attix, the incoming President, and S. K. Campbell, the incoming Vice-President, to the front and inducted them into office.

Dr. LeRoy Southmayd of Great Falls thanked the Yellowstone Valley Medical Society for the hospitality extended the Medical Association of Montana, and thanked the Commercial Club, the hotels, the press and the citizens of Billings for their help in making this session such a good one.

Dr. Brooke moved the meeting adjourn. Seconded by Dr. Deal. Carried.

E. G. Balsam,
Secretary-Treasurer.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Clinical Pediatrics. By John Lovett Morse, M.D., Professor of Pediatrics, Emeritus, Harvard Medical School; Consulting Physician at the Children's, Infants' and Floating Hospitals, Boston. Philadelphia and London: W. B. Saunders Company, 1926. Cloth, $9.00 net.

Professor Morse has written a very practical treatise, notable for its strong commonsense and the emphasis placed upon the essential clinical diagnostic signs and symptoms peculiar to each disorder described. In treatment he is somewhat an iconoclast in showing "the futility and unreasonableness of much of the treatment in common use." He has had a large clinical and teaching experience, is a man of marked personality, and this book reflects his life work and teaching. In the preface he states that he has written it for his own amusement rather than with any idea of enlightening the world or adding to the sum of human knowledge. Also that he has refrained from giving detailed descriptions of microscopic pathologic changes which he would have had to copy from other books and which he would not recognize if he saw them.

All this is very modest and refreshing but all who know Morse know his rare thoroughness and ability and the resulting work is one of the most sound and reliable treatises available, devoid of all clap-trap and faddism, and particularly strong in diagnosis. He finds little evidence for attributing ills of infancy to dentition, unless there is actually redness and swelling about a tooth as the process begins in fetal life and continues into late childhood. His comments about fever in infancy and early life are sensible; considering the anxiety felt by parents in the presence of so-called fever. The diurnal variations in temperature in the normal are noted, and a rectal temperature exceeding 99.6° F. must be found to be considered abnormal.

The discussion of albuminuria is instructive. Five per cent of Harvard students show albuminuria without other pathologic condition. Morse thinks that it is not so frequent in infancy but, apart from the well recognized ortbostatic type, there are others in whom there is vasomotor instability, overacid urine, or unchanged protein passing from the bowels into the circulation in infants. He affirms that the diagnosis of acidosis is often made clinically on insufficient grounds and is almost invariably wrong, that it is a very rare condition. The only pathognomonic symptom of acidosis is a peculiar type of dyspnea or hyperpnea, without cyanosis, and the presence of acetone bodies in the urine does not justify a diagnosis of acid intoxication.

The consideration of tuberculosis is admirably done. Only the von Pirquet and intradermal tests are used and negative results are shown much more useful than positive reactions. In tuberculous meningitis, acute miliary tuberculosis and even in tuberculous peritionitis, the tuberculin tests are commonly negative. The diagnosis of tracheobronchial lymph node tuberculosis is most ably described, the commonest form of tuberculosis in early life, often overlooked and difficult of diagnosis except by coordinating all available clinical signs and symptoms with x-ray examination and tuberculin tests.

Morse recognizes the impossibility of differential diagnosis between encephalitic forms of poliomyelitis and epidemic encephalitis but does not note the fact that seasonal occurrence is of much significance, encephalitis being a winter and poliomyelitis a summer disease. Like most Easterners he does not recognize the boon of Rosenow's serum in either disease. As one of the leading medical men in the world remarked recently to the reviewer, "Rosenow will be famous ten years after he is dead." Morse's book has great practical clinical value and is therefore to be highly commended. WINSLOW.

GOULD'S MEDICAL DICTIONARY, Containing all the Words and Phrases Generally Used in Medicine aud Allied Sciences, with their Pronunciation, Derivatives and Definition. By George M. Gould, A. M., M. D., author of "An Illustrated Dictionary of Medicine, Biology and Allied Sciences," etc. Edited by R. J. E. Scott, M. A., B. C. L., M. D., Editor of Witthaus' Text-Book of Chemistry, etc. Based on Recent Medical Literature, with Many Tables. 1398 pp. $9.00. P. Blakiston's Son and Co.. Philadelphia, 1926.

This volume is the last word in medical dictionaries. In 1890 Gould, "The Johnson of medical lexicology," produced the first edition of his medical dictionary. The present edition is an aggregation of 76,000 words, 5000 of them being entirely new. These comprise (1) new words expressing new ideas, inventions, or discoveries; (2) an increased number of eponyms, words derived from names of individuals whose operation, test or other medical procedure are known under their personal names; (3) the largest class including new remedies, proprietary, patent, or other articles whose names in some way get into current medical literature. The volume contains an interesting collection of photographs of individuals, suggested by certain words. Thus Murphy's button is accompanied by the likeness of John B. Murphy, and Darwin's ear is amplified by the likeness of Charles Darwin. There appear very handy and useful tables of arteries, bones, muscles, nerves, etc., which in small space contain the substance of the many pages of anatomy. A modern dictionary is not a collection of definite spelling and pronunciation, but under many words is included a mass of information, the epitome of many pages found in textbooks. No medical dictionary published is superior to this.

ROENTGEN INTERPRETATION. A manual for Students and Practitioners by George W. Holmes, M. D., Roentgenologist to The Massachusetts General Hospital and Assistant Professor of Roentgenology, Harvard Medical School, and Howard E. Ruggles, M. D., Roentgenologist to The University of California Hospital and Clinical Professor of Roentgenology, University of California Medical School. Third Edition, Revised With 226 Illustrations. 326 pp. $5.00. Lea & Febiger, Philadelphia and New York, 1926.

This is one of the most valuable books on roentgen diagnosis. The descriptions and classifications throughout are brief, only the essential points in diagnosis and differential diagnosis being presented. Two new chapters have been added, one on the spine which is excellent and the other on fluoroscopic technic. All of the chapters have been enlarged; new diagnostic points added to a great many subjects previously described in former volumes. Ventricular studies are a new feature. The volume is profusely and splendidly illustrated, showing typical types of x-ray pathology. This volume should be in the hands of anyone doing x-ray work. BAUMGARTEN.

GOITER AND OTHER DISEASES OF THE THYROID GLAND. By Arnold S. Jackson, M. D., Jackson Clinic, Madison, Wis. 151 Illustrations. 401 pp. $10.00. Paul B. Hoeber, Inc., New York, 1926.

This is a splendid summary of the latest knowledge about goiter. No book that has yet come to our notice so clearly, so simply and so completely describes and discriminates so precisely between the various types of goiter. The author is a graduate of the Mayo Foundation and, therefore, represents and reflects the combined knowledge and personal views of Plummer, C. H. Mayo, McCarty, Broders, Judd, Pemberton, Sistrunk, Boothby, and others in the Mayo Clinic, as well as his own in a large experience with 4,000 goiter patients.

The predominant characteristic of the book is its wonderful simplicity in description and differential diagnosis. Even the high priest of the goiter cult, an acknowledged genius and without a peer as a goiterist, is apt to lead us through meandering verbal labyrinths, embellished with thyroxin, and to finally leave one at the end in a rather helpless state of maze and obscuration. Not so his pupil. One emerges from the perusal of this book with a perfectly clear mental picture of the various types of goiter, and for the first time in many instances, one might venture to say.

The extremely elementary classification covers the whole subject: Colloid, exophthalmic and adenomatous goiter (the latter divided into aberrant, accessory, lingual, intratracheal, pyramidal, substernal, intrathoracic and toxic forms), excluding the special

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Dr. Dorwin Palmer, Roentgenologist

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Dr. John T. Dawson

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ANTITOXIN UP TO DATE

Ever since the discovery of diphtheria antitoxin, biological manufacturers have been endeavoring to overcome certain difficulties associated with its use. One of these, the bulk of the effective dose, has been disposed of by elimination of the water and other nonessential elements, until a product approaching a state of absolute purity has resulted. The best antitoxin, while small in bulk, is sufficiently fluid to ensure prompt absorption and consequently prompt therapeutic effect.

Another difficulty has been that the rubber of the plunger in the syringe packages in which all antitoxins are supplied is very apt to become adherent to the glass barrel of the syringe, and physicians have had no end of trouble in trying to break the adhesions without breaking the syringe.

Parke, Davis & Co., as will be noted by reference to their advertisement elsewhere in this issue, offer not only a highly concentrated antitoxin with low protein content, but an "improved" syringe package. We understand that the improvement consists principally in an ingenious reduction of the area of contact surface between the plunger and the syringe barrel, so that by giving the piston rod a gentle turn the plunger can be rotated and then, of course, moved forward under steady pressure.

infections of the thyroid and malignancy. Moreover, the whole book may be read in a few hours, so terse and pithy is it. But it is in differential diagnosis that the book excels, particularly in discriminating between exophthalmic goiter and the toxic adenoma. There is a table covering two pages and containing all the symptomatic minutiae that will almost enable a chiropractor to make the differential diagnosis between the chief types of goiter, iodine hyperthyroidism and thyroid malignancy.

Perhaps the most important differential diagnostic points in distinguishing toxic adenoma from exophthalmic goiter are the waves of increasing severity, terminating in crises with vomiting and diarrhea, of about three months duration; the low diastolic pressure; and bruits and thrills peculiar to Basedow's disease. Bruits and thrills are, however, found in some cases of colloid goiter, as the author points out. Jackson affirms that iodine improves exophthalmic goiter but has a bad affect on toxic adenoma in often causing iodine hyperthyroidism. This is most important, as iodine at present is used by many in both disorders, since Plummer has demonstrated the marvels of Lugol's solution.

We failed to find that the author discussed in the book the not uncommon complication of Basedow's disease, superimposed upon adenoma which is said to occur in about one-third of the cases of exophthalmic goiter in the Mississippi Valley. Minor points of value are brought out in the diagnosis of Basedow's disease, such as the constant movements of hands and feet, and moisture of the skin, enabling a snap diagnosis to be often made. The loss of power in the quadriceps muscle, as shown by difficulty in climbing stairs, and the increased appetite with loss of weight are also noted.

We find an admirable description of myxedema and it is to be inferred that a metabolic rate between minus 15 and 40 is indicative of the disease. Undoubtedly the author recognizes that many patients have a minus 20 metabolic rate without any symptoms of the disease whatever. The extraordinary curative effect of thyroxin, intravenously in the treatment of myxedema is described. The technic of iodine administration is given in exophthalmic goiter, before and after operation, and in crises. The author still continues to use digitalis in toxic goiter which Plummer now discards, as he thinks it leads to death in some cases from cerebral edema. The increasing frequency of iodine hyperthyroidism, mainly from its mistaken use in toxic adenoma, is discussed.

Chapters are devoted to comparison of medical and surgical treatment of Basedow's disease, to the basal metabolic rate in goiter, to goiter pathology, and to the heart in toxic goiter. Nearly all of the latter 100 pages are taken up with surgical aspects, operative technic, complications and after treatment. We conclude as we began by insisting that this is far and away the most clear, concise, practical and altogether valuable work on goiter, alike to the physician and surgeon, that has thus far been published.

WINSLOW.

ELECTROTHERMIC METHODS IN NEOPLASTIC DISEASES. (desiccation and coagulation) in the Treatment of Neoplastic Diseases. Designed as a Practical Handbook of Surgical Electrotherapy for the Use of Practitioners and Students. By J. Douglas Morgan, B. A., M. D., Instructor in Radiology, University of Pennsylvania Graduate School of Medicine, etc. Illustrated with 36 Line and Half-tone Engravings. 172 pp. $2.50. F. A. Davis Company, Philadelphia, 1926.

The present-day interest in electrotherapy as used in the treatment of malignant and benign growths makes a book of this character timely and useful. The author presents in brief form the principles underlying this form of therapy. He explains the technic for electrodesiccation and electrocoagulation, detailing different conditions to which each is applicable. The principles discussed are presented in such a clear manner that anyone can obtain suggestions which will be useful in carrying out these modes of therapy.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume X, Number 1, (Philadelphia Number, July 1926.) Octavo of 260 pages with 24 Illustrations. Per Clinic Year, July 1926 to May 1927, Paper $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

This volume offers discussions of many timely topics which are profitable reading to any practitioner. Strecker presents two cases illustrating paresis sine syphilis. He states that from time to time instances of nonluetic paresis are reported, bearing striking resemblance to paralytic dementia. Alcohol, lead, multiple sclerosis, frontal lobe disease, and epidemic encephalitis are cited as causes in certain cases. The report from The Chevalier Jackson Bronchoscopic Clinic offers fascinating reading. A peanut in the bronchus, a kewpie doll in the larynx were removed by bronchoscopy. A series of papillomata of the larynx are described treated in this method. One case, a child of six years; had been treated by radium which not only had not removed the papilloma but destroyed the child's larynx. Mohler discusses precordial pain which has a diversified etiology. The most common cause is cardiovascular renal disease associated with constant hypertension. Aortitis is another common cause. An interesting question is the location of the pain. Since the heart possesses no nerves of sensation, the seat of the pain may be in the spinal cord centers, whence the sense of pain may be transmitted to the structures which they control.

ANTIPRESSOR FRACTION FROM LIVER TISSUE AND ITS PHYSIOLOGIC ACTION. The clinical results obtained by A. A. James, N. B. Laughton and A. Bruce Macallum, London, Ont. (*Journal A. M. A.*, July 31, 1926), with liver extracts have been gratifying. In some patients, the depression in blood pressure was very gradual, and the lowest point was reached many hours after the injection. In other cases the effort was immediate and persistent. The chemical nature of the depressor substance is unknown. However, the effects of tetra-ethyl-ammonium compounds on the blood pressure in dogs more nearly resembles those obtained by the use of liver extracts than do other known depressor substances.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho, Montana and Pacific Northwest Medical Association

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ADDRESS

MEDICAL PROBLEMS IN IDAHO*

N. R. Wallentine, M.D.
SANDPOINT, IDA.

In this rapidly moving age we are prone to think that conditions are entirely different from what they were centuries ago or even a few years ago, but they are the same today as in the past. On March 11, 1823, the following resolution was offered and adopted by the Medical Society of New Jersey: "That the medical gentlemen now members of the legislature, and members of the Medical Society of New Jersey, be, and they are hereby requested to use their influence in procuring a modification of the laws regulating the practice of psychic and surgery, so as to restrain irregular practitioners and pretenders in medicine from practicing, by inflicting such fines and penalties as may by them be deemed advisable, and that a committee of the medical gentlemen be appointed to confer with those members of the legislature." This was over a hundred years ago and sounds as if it were yesterday.

Again, in 1847, about eighty years ago, the first President of the American Medical Association, in his presidential address said, "Quacks and irregulars swarm through the land like locusts." So we find that quackery is not of recent origin and also that many facts, upon which the practice of medicine is based, are as old as the history of the human race itself. In fact, scientific medicine had its origin in what we today would call quackery. Early historical records prove that medicine was entirely in the hands of priest-physicians who claimed to possess the most potent charms and therapeutic measures. From this body of priest-physicians there gradually grew up a body of lay-physicians who were in excellent standing in the community, were protected by law and were even maintained at the expense of the state, which shows incidentally that state medicine is as old as the profession itself.

While at this early date numerous remedies were in use, their employment was more or less mixed with incantations and priestly interpretations of natural phenomena. Medicine became gradually separated from philosophy and religion, until at the time of Hypocrates it became a more or less distinct and recognized science. So we find, in going back into the history of medicine, it has been more or less intimately connected with cults, magic, etc., until today we are beset on all sides by cults and quacks of every sort, claiming as they always have done from the beginning of time and probably always will claim great virtue for some particular fad or fancy, which has no real scientific basis. We also find that from early history down to the present time medicine has been recognized by law, and governed and controlled to a certain extent, which is right and proper, if it can be intelligently supervised. As early as 1140, Roger of Normandy promulgated a law that, "Whoever, from this time forth desires to practise medicine must present himself before our officials and judges and be subject to their decision. Anyone audacious enough to neglect this shall be punished by imprisonment and confiscation of goods. This decree has for its object the protection of our kingdom from dangers arising from ignorance of practitioners."

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* President's Address, read before the Thirty-fourth Annual Meeting of Idaho State Medical Association, Sandpoint, Ida., September 2-4, 1926.

All of these facts merely bring to mind the idea that our problems today are very similar to the problems with which medical men in all ages have had to contend. Laws have been enacted and people prosecuted all to no avail, until at the present time we are still trying to control the cults by legislation. And until a better era comes we may be compelled to do so for our own protection.

One standard of education for all who practise medicine in any of its forms is a very much to be desired goal, and a wholehearted cooperation and an united front in the regular medical profession would go a long way toward attaining this aim. This was very clearly demonstrated at our recent meeting in Boise in February of this year, at which time we would have been entirely lost, had we not had absolute unity. But as a result of this unity we secured recognition and demonstrated that it would be necessary for the "powers that be" at Boise to deal with the profession as a unit. And let me say right here that it was the organization of the Public Health League that made this possible. While we did not gain our goal we did gain recognition.

In olden times empires expanded by inciting war between two neighboring cities, thus exhausting their strength and then capturing both. So it is today in medicine. The public endeavors and in a great many cases succeeds in playing one physician against the other for its own gain and to the detriment of the physicians. For instance, there has been more or less bitter feeling between the State Insurance Fund and the physicians over the state handling industrial cases. In some communities the Insurance Fund has threatened to import physicians for the purpose of taking care of their industrial cases, and in such instances single physicians have made offers to take these cases at reduced prices. This is not unity or cooperation and in the end no one in the profession can possibly be benefited by such action.

On the other hand, the State Insurance Fund has its just grievances against the medical profession. There is a certain small number of physicians who no doubt have padded bills and have been dishonest in other ways in their dealings with the Insurance Fund. I believe the profession itself should be the one to take action in these cases in order to protect the integrity and good name of the medical profession throughout the state. If we do not do this someone else will do it for us.

Dr. Walter Kelton, who was medical advisor for the Department of Labor for the State of Washington in 1925, stated that the Medical Aid Act in that state was in jeopardy and that the physicians and surgeons of the state were confronted with an alternative of competitive insurance or state medicine. The cost of the Medical Aid, he said, had in some classes increased so rapidly that employers were preparing to ask for legislative relief through permission to enter competitive insurance. Incompetent treatment, padded bills, unnecessary hospitalization, surgical and medical bills which could not have been incurred in industry were among the things which caused the increased cost of the department and were found in claims listed with the state and approved by physicians who attended patients. I believe Washington is no exception and that we have some of the same things taking place in our own state.

To avoid the most radical forms of state medicine and to hold our own with the quacks, we need to be honest with ourselves and the public. Educate the public, which can be done through such magazines as Hygeia, The Scientific American and other periodicals of this type. The Public Health League within the state has been handling this situation by publishing timely articles in the newspapers over the state. The Gorgas Memorial Institute is doing the same thing throughout the United States. It is also providing radio talks, and using every form of publicity to educate the public along health lines.

In this way we can gain the confidence of the public which will materially aid us in combatting disease and building up a substantial health policy. This, of course, will take time and cannot be expected to bring us any immediate relief but in time it will have its effect. I believe the time has arrived when it is absolutely necessary for us, in order to protect our own interests, to have physicians in the legislature. Ours is practically the only profession or business of any magnitude which does not have men of ability in the legistlature to protect its interest.

There are numerous problems confronting the medical profession in this state at the present time. I am sorry to say that I have no specific cure for any of them but a few suggestions at this time, I believe, will do no harm. Inasmuch as the success of quackery depends on ignorance and superstition and our success on enlightenment and education, it naturally follows that the thing of prime importance is the education of the public. Let us throw off our age-old cloak of secrecy and seclusion and tell the world what we have to offer and show them the difference between the accomplishments of the medical profession and the accomplishments of the quack. Let us pull together at all times both for the advancement of our profession and for our own private success. Let us get away from the idea of individualism, and rather work for the good of the whole profession.

Another suggestion I have to offer is that all our troubles are not coming from the outside. We need a little housecleaning in our own profession. We need more physicians who believe in and will support the ethics of our profession. I am reliably informed that there are physicians in certain communities in this state who confer with and refer cases to chiropractors and osteopaths. You may judge for yourselves of the scientific attainments of such physicians. Such conditions are abominable and should not be tolerated. Again, we have physicians in our society who tell patients that they have barely come to them in time and, had they remained with their previous doctor any longer, it would have been too late to help them. Such tactics are all wrong and these are pure advertising fakers. These men should be disciplined by our organization.

Another point I wish to make is that the public is demanding public health education and, if we do not lead in this matter, other and less qualified agencies will do so and thus get the public on the wrong track. Physicians are the only persons qualified by education and experience to give this teaching. Let us begin by recommending periodical health examinations in the apparently healthy. Scientific medicine has conquered almost all the specific infectious diseases and has entirely eradicated some of the worst ones. Our next big problem is to tackle the warding off of the degenerative diseases of middle life, which we can do by systematic education of both the public and physicians to the value of periodic examinations. In this way many of these diseases, as you know, can be detected in their incipiency. Tell the public the accomplishments of scientific medicine and what it has to offer and we need not worry about the cults.

Before closing I wish to say that the Public Health League is of inestimable value to every physician in this state. I wish that I were at liberty to tell you of some of the inside workings of this League, some of its accomplishments and the manner in which it has been accomplished. I believe that, if every physician in this state knew what I know regarding the League and its activities, we would have a one hundred per cent membership and would be in a position really to do things which need the attention of the League but, owing to lack of funds, it is unable to accomplish.

It may appear to some of you that this address is more of a criticism than anything else but I feel we should know our own shortcomings, and not be like the ostrich and hide our heads in the sand. Some one said in a recent medical publication that Rip Van Winkle slept for twenty years, but he did not have anything on the medical profession because they were still asleep after hundreds of years.

If I have been able to arouse even a little enthusiasm as to some of the needs of this society, I will have been well repaid for my trouble. Even if we are asleep, remember that the irregulars and the public are not. And it is not a question of holding what we have, but one of regaining what we have lost, because there is no argument but that a large percentage of people are patronizing quacks in preference to the regular medical profession. The cause is self evident.

Our attitude toward the state society should not be, as it is in a good many cases, "what has the society done for me" but, "what have I done for the welfare of the state society?" We should be able to see farther than our own selfish interests and put the good of the organization foremost.

Now, if we are to have state medicine, let us have it, but I am unalterably opposed to accepting the fee schedule promulgated by the Industrial Accident Board in conjunction with the State Insurance Fund. That fee schedule is an insult to the dignity and training of any respectable physician. When you take away the self-respect of any man or class of men, you take that which cannot be replaced. The Workmen's Compensation Act, as administered in this state, is a travesty on justice. Neither the workman nor the physician receives his just dues. This law was not passed for political purposes but it is certainly being used for such. It was never intended that this law should be used to build up a huge surplus in the Insurance Fund, but in order that the workman should get a small compensation while he is disabled, and incidentally that the physician should be paid a decent stipend for his services to that injured workman. We as physicians are entitled to as great a fee from a corporation or an association, which has money for the distinct purpose, as we are from our private patients. And until the State Insurance Fund and the Industrial Accident Board see fit to treat us as reasonable, honest and intelligent human beings, I am in favor of going to almost any limits within reason to see that the injured workman gets his just dues. I for one am not going to barter my rights for a mess of pottage, and thus jeopardize the future, not only of myself but of the members of this profession who shall follow me. I am ready at this time to lend every effort toward perfecting our organization to the point where we shall be a greater factor in health betterment, and be in a position to protect our own rights.

There is no profession or group of men who are as unselfish as the members of this profession, or who give more of their time, energy and service for charity. I am willing at all times to extend charity where charity is needed, but the proposition of adequate fees for industrial accidents is not one where charity comes in at all and, furthermore, if the State Insurance Fund wants to get rid of padding bills, it might be an inducement to any who would pad bills, if he received a just compensation for his services.

This problem of fees under the Compensation Act has to be settled eventually and we may as well settle on a definite line of action right now as any time. If we accept this schedule, which is a reduced schedule, it will be merely a matter of time until we are compelled to accept further reductions, and remember this is merely the entering wedge. During the next session of the legislature we can look for more trouble, not only from the cults but from the State Insurance Fund. Whether we accept this or not, there will be certain measures introduced as were introduced last session, detrimental to our interests, originating from the same source. Are we ready to fight this thing out? If not let us get ready. We can do no better than to get a hundred per cent membership in the League and then everybody get up on his toes and be ready to give every support needed by our organization.

I would make a special appeal at this time to every member, to become an active member in his county society, in an effort to make his society a factor for good in his community, and thus gain that leadership so essential toward building up a progressive health policy among the public, and toward building a strong, helpful and progressive state society.

I merely wish to mention the tuberculosis problem in this state, because there is a committee from the society which is handling it. But I ask every member to take home with him the thought that there have been more than 2000 people who have died of tuberculosis in this state in the past ten years and yet we have no sanitarium for the treatment of this disease. A goodly number of this 2000 could have been saved as useful citizens to their respective communities, had they had proper institutional care. When you go back to your homes, I hope you will use your influence with your legislators, and in addition create as much public sentiment as possible for the establishment of a state tuberculosis hospital. This, to my mind, is one of the real problems which we as a state society should endeavor to put across. If we can accomplish some of the larger humanitarian problems, our own individual success will be pretty well assured. The value of any organization should be measured by the good it does for society in general and not by its own private gain.

TONSILLECTOMY IN CHILDREN. Based on an analysis of the complaints of 1,200 children with the results found three years later, and compared to 1,200 children with similar complaints, but in whom operation was denied but also examined three years later, the following conclusions are drawn by Albert D. Kaiser, Rochester, N. Y. (Journal A. M. A., Sept. 25, 1926), as bearing on the indications for tonsillectomy and adenoidectomy: 1. Mouth breathing is a definite indication for tonsil and adenoid removal. 2. Frequent attacks of sore throat and tonsillitis offer a definite cause for removal of tonsils. 3. Frequent head colds, relieved in 75 per cent of the cases, offer a definite indication for tonsil and adenoid removal. 4. Persistent enlargement of the cervical glands, when no other cause is found, is a just cause for tonsil removal. 5. Malnutrition, when other causes have been eliminated, will be improved somewhat and therefore may be considered an indication. 6. Chronic and recurrent discharging ears are an indication for the operation. 7. Unexplained fevers, in the absence of other indications, may be a just cause for tonsillectomy; but there is no guarantee that they will not recur unless the fever comes from an obscure tonsil infection. 8. For the prevention of respiratory infections, such as laryngitis, bronchitis and pneumonia, no positive indication exists, as the incidence of these infections was not influenced favorably or unfavorably by operation. 9. The prevention of diphtheria and scarlet fever may be considered an indication, as the incidence of these diseases was slightly less in the group operated on; and when it did occur, the sequelae were less serious when the tonsils were removed. 10. The presence of positive or suspected evidence of the rheumatic syndrome manifestations, rheumatism, chorea and heart disease, is a definite indication for tonsillectomy

ORIGINAL CONTRIBUTIONS

CESAREAN SECTION AT THE JOHNS HOPKINS HOSPITAL*

J. Whitridge Williams
BALTIMORE, MD.

Owing to the great abuse of this operation in many parts of the country, I thought that it might be timely, and perhaps interesting, to bring before you the indications followed and the results obtained in the Womans Clinic of the Johns Hopkins Hospital.

Our material is of especial interest from three points of view. First, it represents the experience of one man for a period of thirty years, during which cesarean section has become converted from a serious operation to one followed by such satisfactory results that it is in danger of being abused. Second, our service presents, relatively at least, the largest contracted pelvis material in the country, owing to the fact that one half of its patients are negroes, in whom the incidence of pelvic abnormalities approaches 40 per cent. Third, the fact that the material is used for the instruction of students makes it imperative that our teaching should be as conservative as is consistent with the best interests of the patients. It should be said at the outset that our prime indication for cesarean section is afforded by disproportion between the size of the head and the pelvis, and that all other indications play a secondary role.

During these thirty years I have learned a great deal about the operation, and my personal experience with its development may be of interest. When I began to do it, a cesarean section was considered a cesarean section, and we had not learned that its mortality depends upon the time it is done, nor that it increases from practically nothing if performed at an appointed time before the onset of labor, or just afterwards, to 10 or 15 per cent when done late in the second stage. Consequently, in the first stage of my development, which may be designated as the period of learning, the mortality following the classical section was relatively high. As years went by the necessity arose for effecting sterilization at repeated sections upon the same woman, as well as for overcoming the mechanical effects of uterine myomata obstructing labor, both of which were effected by supravaginal amputation of the uterus with burial of the cervical stump. It was soon noticed that the convalescence following this relatively severe operation was much more satisfactory than after the simpler classical section, and the conclusion was promptly drawn that the involuting puerperal uterus did not offer ideal conditions for combatting infection, so that if signs of infection were present, the safest procedure was amputation of the uterus.

All such uteri were subjected to careful microscopic examination, and we soon learned that not only in frankly infected patients, but also in those who had been long in labor but who did not present clinical symptoms of infection, the microscopic sections revealed histologic evidences of infection, beginning in the cervix and ascending into the uterine cavity. Moreover, suitably stained sections revealed the presence of bacteria. It soon became apparent that this "ascending infection" became more pronounced with every hour labor had lasted before operation, and that it was absent only when the uterus had been amputated at or before the onset of labor.

Such observations afforded a satisfactory explanation for the relatively poor results following the classical operation, and taught us that, while the peritoneum can cope satisfactorily with the contamination incident to the removal of an infected uterus, if the organ were retained, it offered such favorable conditions for the spread of infection that general peritonitis frequently followed. With this knowledge at our disposal our course was clear, and we thereupon limited the classical operation to patients upon whom it could be performed at an appointed time before the onset of labor or at most not later than six hours after it, while in all other patients, and especially those presenting clinical signs of infection, supravaginal amputation was done. The sequel demonstrated the correctness of our conclusions, and since that time we have lost only two classical sections from infection, while in a series of 95 radical sections only a single death from infection occurred.

Still further force is lent to these conclusions by the, as yet, unpublished bacteriologic investigations of my associate, J. W. Harris, who during the past eighteen months has studied the bacterial contents of the uterus at the time of the section. In approximately fifty operations cultures have been made from a sterile cotton swab introduced into the lower uterine segment immediately following the birth of the child, and before the fingers enter the wound, and Harris found them uniformly sterile in all elective sections, and constantly positive whenever more than six hours had elapsed between the onset of labor and the time of operation, irrespective of whether the temperature was elevated or not. In the positive cultures the predominating bacterium was the streptococcus, which occurred both in the aerobic and anerobic, and in the hemolytic and nonhemolytic varieties.

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*Read before the Fifth Annual Meeting of Pacific Northwest Medical Association, Spokane, Wash., July 1-3, 1926.

These findings strikingly confirm the correctness of our clinical deductions and histologic studies, and demonstrate beyond peradventure that there is a time of election for the classical operation, and whenever it is not chosen the danger to the patient becomes greatly increased, unless steps are taken to combat the ascending infection by supravaginal amputation or by some other device. This brings us to the consideration of the various changes in operative technic which have been advocated in the hope of minimizing, or doing away with the dangers mentioned.

As soon as the so-called extraperitoneal section was introduced by Latzo, Küstner and others, I gave it a trial, but our experience in five cases satisfied me that it was not a panacea. I found it so difficult an operation as to be beyond the capacity of the casual operator, but its great defect was that it frequently fails to fulfill its design, in that the peritoneum becomes injured while being peeled off from the anterior wall of the uterus, and thus renders illusory the hope of an extraperitoneal access to the organ.

Moreover, when the several types of low cervical section were first advocated by Kronig, Beck, DeLee and others, I was sceptical concerning their advantages, as I felt that the opening up of the pelvic connective tissue would facilitate rather than limit the spread of infection. Consequently, it was not until after Hofbauer, in our service, had demonstrated the presence of a protective cellular mechanism in the connective tissue at the lateral margins of the uterus and in the broad ligaments that I felt any enthusiasm concerning the operation. But with Hofbauer's findings in mind, I have employed it in twenty neglected cases with satisfactory results, and I am now prepared to state that, when the time for an elective section has passed, the low operation enables us to obtain results which were formerly possible only after a radical operation, and sometimes enables us to obviate the sacrifice of the uterus. Notwithstanding this endorsement, I see no advantage in attempting to substitute it indiscriminately for the easier elective classical section, while I consider it altogether inappropriate in frankly infected patients, in whom the radical section must remain the procedure of choice.

In 1921, in a paper entitled, "A Critical Analysis of Twenty-one Years Experience with Cesarean Section," I considered in detail the results obtained in 183 operations performed prior to December 31, 1920, and on this occasion I desire to consider a series of 180 additional operations performed up to March 31, 1926, with particular reference to the indications followed. It should be noted that the 363 operations were done by me, by my several associates and by a succession of resident obstetricians, so that the results obtained cannot be attributed to special skill on the part of a single operator.

It should further be noted that almost as many operations have been done during the past six years as in the twenty-six years preceding. This is in part due to a very considerable increase in the size of the material, as over one-third of our total number of deliveries have occurred since the former paper was written. A considerable part of the increase, however, is due to greater liberality in indications for the operation both in contracted pelves and in nonpelvic conditions, as was recently pointed out in an aticle by myself and Sun, entitled "A Statistical Study of the Incidence and Treatment of Labor Complicated by Contracted Pelvis in the Obstetric Service of the Johns Hopkins Hospital from 1896 to 1924."

In other words, 363 cesarean sections have been done in approximately 28,000 admissions, an incidence of 1.3 per cent or one to every 77 admissions, which we contend is relatively conservative, when the excessive incidence of contracted pelvis in our service is borne in mind. In this connection it might also be stated that 50 pubiotomies were done in the first period and, as we have practically abandoned that operation, it might be permissible to add that number of cesareans to that series. If that were done, it would raise the number to 413 (?), which would give an incidence of 1.5 per cent, or 1 to 68 admissions.

TABLE I.

Gross Statistics

January 1, 1921 to April 1, 1926

180 cesareans

122	Conservative sections,	with 1 death
20	Low cervical sections,	with no deaths
38	Radical Sections	with 5 deaths

6 deaths in 180 operations
Gross mortality, 3.33 per cent
Infectious mortality, 0.56 per cent

TABLE II.

SHOWING MORBIDITY AND WOUND HEALING TIME OF OPERATION

		Elective		First 6 Hours		After 6 Hours			Wound Healing		
	Total Percentage Febrile	Frequency Per Cent	Febrile Per Cent	Frequency Per Cent	Febrile Per Cent	Frequency Per Cent	Febrile Per Cent	First Intention	Stitch Abscess	Infected	Total Defective
122 Conservative	36	50.0	14.75	40.0	56.24	10.0	75.0	93.5	4.1	2.4	6.5
20 Low Cervical	80	....	....	5.0	100.0	95.0	84.21	50.0	5.0	45.0	50.0
38 Radical	74.3*	20.0	14.3	17.14	66.67	62.86	95.4	60.0	2.86	37.14	40.0

Table I gives a bird's eye view of our experience in the second series and indicates that the results were reasonably satisfactory. The choice of operative procedure was based upon the considerations enumerated in the introductory part of this paper, and apparently justifies their wisdom.

It is seen that in 122 conservative sections, which were in great part elective, there were no deaths from infection and only a single fatality from any cause. In that instance the patient was admitted profoundly shocked from concealed hemorrhage, following premature separation of the normally implanted placenta and died at the conclusion of the operation. There were no deaths in the twenty low cervical sections, all done late in labor for disproportion. Many of the patients were seriously ill during the puerperium, and it is probable that several of them would have died had the conservative technic been chosen.

The greatest mortality occurred in the thirty-eight radical sections. As the table indicates, there were five deaths, only one of which was due to infection, and at autopsy it was found that it was attributable to the extension of an old broad ligament inflammatory process which had originated prior to the operation. The remaining four deaths were in no way attributable to the operation, but rather to the condition for which it was undertaken, namely, two deaths due to shock resulting from premature separation of the placenta, and the remainder to the rupture of the scar of previous sections. In other words, it is apparent that our aseptic technic was satisfactory, and that intelligent choice in the type of operation has reduced to a minimum the danger of death from infection, which, as has already been stated, occurred only once in 180 operations, an incidence of somewhat over one-half of one per cent (0.56 per cent).

The advantages incident to the several types of operation is strikingly shown in Table II. Here it is seen that with the conservative operation, the puerperal morbidity (temperature of 101° or more) increases proportionately with the number of hours elapsing between the onset of labor and the time of section; that is, from 14.75 to 75 per cent, according as the operation was performed at an appointed time at the end of pregnancy or after labor had continued for more than six hours. A similar computation cannot be made in the case of the low cervical sections, for the reason that no elective operations fell in that category; but the fact that practically all of the patients presented abnormal puerperia clearly indicates the wisdom of having chosen that technic. Similar considerations hold in the case of the radical section, and the table shows that when performed at an elective time its results are excellent, whereas abnormal puerperia are the rule when it is done late. It must, however, be remembered that a considerable proportion of the late radical operations were done primarily on account of the existence of frank infection, which of itself would necessitate a febrile course.

The portion of Table II dealing with wound healing needs but little explanation, but it may be inquired why the results were worse with the low cervical rather than with the radical sections. The answer is self-evident when one considers that only one of the former, as contrasted with thirteen of the latter, were done before the onset of labor or within the first six hours following it.

Passing on to the consideration of the indications for cesarean section, Table III shows that 80 per cent of the 142 conservative and low sections were done on account of disproportion due to contracted pelvis, and only 20 per cent for other causes.

It is apparent from these figures that in our material contracted pelvis affords the indication par excellence, and that is as it should be. What we try to do in these circumstances is to study our patients so carefully during the latter part of preg-

TABLE III.

Showing Indications for 142 Conservative and Low Sections

113 or 80 per cent for contracted pelvis
29 or 20 per cent for other causes
7 for acute toxemia
1 for eclampsia (1923)
7 for premature separation of placenta
4 for elderly primiparaty
2 for placenta previa
2 for defective scar previous cesarean
1 for repeated uterine inertia
1 for rigid cervix with infection (36 hours)
1 for contraction ring dystocia
1 for myoma
1 for ovarian tumor
1 for anus vestibularis
—
29

nancy as to be able to differentiate in advance between those in whom the disproportion is so great that the head will not engage during the course of labor and those in whom it will. In the former we do an elective section at an appointed time before the onset of labor, while in the latter we look for a spontaneous outcome. If we were all-wise, this would solve the question, but unfortunately we are not; so it sometimes happens, when we have predicted a spontaneous outcome, that engagement fails to occur after a test of the second stage. In such circumstances the time for election has passed, and the dangers of a conservative section have become so great that it is unjustifiable, and it is here that the low operation finds its most frequent indication, as it enables us to avoid a destructive operation or the sacrifice of the uterus, as was formerly the case.

Such a mode of procedure demands the most conscientious prenatal care, and in doubtful cases the repeated examination of the patient during the last weeks of pregnancy by an experienced obstetrician. In general it is surprising how great a degree of prognostic ability may be attained, but it should always be remembered that none of us are omniscient, and it will occasionally happen that the predicted spontaneous outcome will not occur, and, on the other hand, if the patient delays entering the service until late in labor, engagement may occur notwithstanding our prediction to the contrary.

Thus far no one can cavil with our course, and it is concerning the nonpelvic indications that there is the greatest room for difference of opinion and discussion. It will be noted in Table III that no operations were done on account of abnormal presentations *per se,* and later on this point will be discussed more fully. On the other hand, practically one-half of the nonpelvic operations were done on account of acute toxemia and premature separation of the placenta, as contrasted with a single operation for eclampsia and two for placenta previa. Table IV gives the indications for the 38 radical sections, and shows that two-thirds of them were done primarily on account of contracted pelvis.

TABLE IV.

Showing Indications for 38 Radical Sections

25, or 66 per cent for contracted pelvis, 9 primarily for sterilization. (7 after third, 1 after second section and 1 for social indication.)
10 for intrapartum infection
6 for various accessory indications
13, or 34 per cent had normal pelves
1 sterilization for chronic nephritis
3 for myoma
2 for premature separation of placenta
1 for bicornuate uterus
1 for atresia of cervix
2 for ruptured cesarean scar
1 for neglected brow—threatened rupture
1 for placenta previa, plus infection
1 for contraction ring dystocia

In this group it is seen that nine operations were done for the purpose of sterilizing patients at a repeated section. Such operations were usually elective, and were done in part at the request of the patient and in part at my suggestion, as I feel in general with ward patients that sterilization is permissible at a third section, provided the children are living. In such cases it is our custom to explain that sterilization can be effected in several ways, and be followed or not by menstruation. The patient is then asked whether she desires to menstruate in the future, and, if she replies in the affirmative, the elective operation is followed by section of the tubes and the burial of their proximal ends between the folds of the broad ligaments; whereas, if the reply is in the negative, the uterus is amputated with retention of the tubes and ovaries. I do this the more readily, as I have found that the convalescence is even smoother than after an elective conservative section.

The second group of radical sections consists of patients with pelvis sufficiently contracted to require section, but who enter the service presenting clinical signs of intrapartum infection after having been neglected. With the exception of dystocia due to the presence of obstructing uterine myomata, this to our minds represents the indication par excellence for radical section, as such cases are entirely unsuitable fora conservative operation, give a dubious prognosis with the low operation, and yet recover almost without exception following a radical one; although in the latter event the puerperium is frequently stormy, but fortunately in many instances far less so than one would expect.

A glance at the nonpelvic indications enumerated in Table IV suffice to show that they were justifiable and did not err on the side of radicalism.

In summing up our views on the indications for the several types of cesarean section, I would recapitulate that insurmountable disproportion between the size of the head and the pelvis and obstruction by tumor are practically the only indications concerning which there can be no dispute, and that all others should be invoked only in individual cases and then only after mature consideration. It has already been noted that in none of the 180 operations did the indications consist primarily of abnormal presentations on the part of the child, and the current tendency to resort to cesarean section for breech, occiput posterior or other abnormal presentations in normal women can not be reprobated too strongly. Naturally, I am willing to admit that a breech presentation occurring in a really elderly primipara with a rigid cervix and a normal pelvis may afford a justifiable indication, but such cases are very exceptional, and by no means justify the current tendency toward indiscriminate radicalism. On the other hand, we frequently resort to cesarean section in the presence of abnormal presentations, but in such circumstances the abnormality is the result of the contracted pelvis, and if radical interference is necessary, it is on account of the pelvic condition and not because the child does not present by the vertex. Moreover, radical interference is sometimes imperative in neglected transverse, face or brow presentations in women with normal pelves, but in such cases it must be regarded as an emergency measure which is undertaken in order to prevent rupture of the uterus or the sacrifice of a good child, and must usually be followed by amputation of the uterus.

From my reading and conversations with medical men I have come to the conclusion that the first thought which occurs to many in the presence of eclampsia is delivery by cesarean section. To my mind this constitutes an abuse of the first magnitude, in that it is not only poor obstetrics, but actually adds to the danger of the patient. In accordance with Eden, after accouchement forcé, I consider it the worst treatment to which the eclamptic woman can be subjected, and my reasons for that belief will be given in my address tomorrow on the toxemias of pregnancy, and which will shortly appear in the *Journal of the American Medical Association.* Here it will suffice to state that it is unnecessary in the mild cases, while in the severe ones the performance of any serious operation under general anesthesia frequently defeats the very purpose for which it is undertaken. My associate, H. J. Stander, has just shown that the administration of any general anesthetic promptly produces in the blood of normal individuals changes strikingly similar to those occurring in eclampsia. Consequently, if such a toxemia is superadded to that from which the eclamptic patient is already suffering, it is readily comprehensible that it may turn the scales toward an unfavorable termination. It will be noted that in the present series only a single section was done for this indication, and that was three years ago.

On the other hand, I feel that in certain cases of acute fulminating preeclamptic toxemia, in which the cervix is so rigid that eclampsia will probably supervene before its dilatation can be effected by means of a balloon, section does offer the most promising means of preventing its outbreak, more particularly if it be effected under cocaine administered locally or spinally instead of under a general anesthetic, and our tables show that this indication was utilized in seven instances.

Notwithstanding its advocacy by Stoeckel and other authorities, I feel that the frequent employment of cesarean section in the treatment of placenta previa constitutes a serious abuse. From my own experience I know that intelligent treatment by means of the bag gives such satisfactory results that other treatment is unnecessary. It would lead too far afield in this place to attempt to justify my views statistically, and you must accept on faith the statement that I consider that section is indicated only in the rarest cases of placenta previa; as, for example, when we have to deal with its complete variety associated with a rigid cervix. This association, however, I have only encountered twice, and it is so rare as almost to constitute a contradiction of terms. I am quite willing to admit that cesarean section in the hands of a competent general surgeon may give better results than more conservative treatment in the hands of a tyro. This, however, is begging the question, as what we are interested in is the best possible obstetric procedure, and not in makeshift emergency treatment.

Our tables show that three sections were done for this indication, and they deserve a few words of consideration. One was a perfectly justifiable operation, as it was performed in the presence of the indication just mentioned. The second was done at the urgent desire of one of the residents, but while successful it was not strictly indicated; while the third one was terminated by a radical section. In this instance the marginal placenta previa was an accidental finding, and the real indication consisted in intrapartum infection complicating pelvic dystocia.

Furthermore, it should always be remembered when contemplating cesarean section for placenta previa or for any other nonpelvic indication that the future obstetric status of the patient demands consideration, and that while cesarean section may offer a satisfactory means of coping with the immediate situation, the existence of the uterine cicatrix materially diminishes the obstetric efficiency of the patient. Every one is acquainted with the possibility of its rupture in a subsequent pregnancy, and it constitutes so great a danger in the eyes of many as to have given rise to the dictum "once a cesarean always a cesarean." While I do not recognize its universal application, I nevertheless appreciate its implication, and the fact that we have had to deal with five such ruptures with two deaths has taught us that the danger is not negligible. Furthermore, while we may say that a properly done cesarean entails but little risk, and while the patient admits that the convalescence is not onerous, yet we find that the prospect of repeated operations has a decided tendency toward limiting fertility.

This is well exemplified by the following experience. A patient, who required operation as the result of a fracture of the pelvis, was immensely pleased with the success of a first section, and afterwards said that she expected to have six more. A second successful section followed two years later, and upon questioning her I found that a good deal of her enthusiasm has evaporated, but when she returned for the third section eighteen months later, she said that she was "through," and in spite of the fact that she was a reasonably devout Catholic, demanded sterilization, as she said she had three children to take care of and did not feel justified in voluntarily assuming further operative risks. I agreed with her, and the moral which I draw from her experience is that, unless it is our ideal to terminate all pregnancies by operative means and to limit radically the size of families, it is important to avoid the necessity for a uterine cicatrix except where it is essential, and that means the greatest conservatism and individualization in fixing the indications for all sections, and particularly for those for nonpelvic conditions.

After Reynolds introduced the term "constitutional inferiority," that elastic indication has afforded considerable opportunity for the abuse of cesarean section. Doubtless in certain cases it affords a perfectly justifiable indication, and I recall the case of a forty-three year old primipara, who was old beyond her years and had an almost cartilaginous cervix, in whom the operation stood me in good stead. On the other hand, when perfectly normal young women come to consult me concerning the prospects of a subsequent pregnancy, and tell me that the first pregnancy had been terminated by cesarean on account of an imperfectly dilated cervix after a few hours of labor, my respect for their medical attendants reaches the vanishing point. For it is my belief that such ignorance of the principles of good obstetrics had placed the woman in unnecessary danger during her first delivery, had left her a poor obstetric risk for the future, and had forced me to face a problem very difficult of solution, unless I am willing to condemn her to repeated sections in any subsequent pregnancy.

Without accepting in its entirety the dictum, "once a cesarean always a cesarean," it follows that in dealing with labor in patients with markedly contracted pelves the necessity for repeated operation frequently arises, and Table V gives an idea of what has occurred in our service.

TABLE V.

Showing the frequency of repeated sections.

363 cesarean sections in 283 women	
201 had first and only section in service with 201 labors	
82 had repeated sections in service with 162 labors	
61 women had two sections	
42 both in service, with	84 labors
19 only 2nd in service with	19 labors
19 women had three sections	
15 all three in service with	45 labors
2 with two in service with	4 labors
2 with one in service with	2 labors
2 women had four sections	
Both in service with	8 labors
82 women	162 labors

There will shortly appear in the *American Journal of Obstetrics and Gynecology* an article by my former associate, Karl M. Wilson, dealing with the obstetric fate of such of our patients as became pregnant following cesarean section. To it are referred those interested in the details of the subject, and here it will suffice to direct attention to several points. In the first place, many of the patients with sections for nonpelvic indications have subsequently been delivered spontaneously, although Wilson gained the impression that on the whole they became pregnant less frequently than other women of the same age and exposed to similar chances of conception. He was unable to determine whether this resulted from the employment of contraceptive means, or from an actual impairment of the ability for conception, possibly associated with inflammatory changes in the genitalia or with the presence of the cicatrix in the uterine wall.

Likewise, a certain proportion of the patients, upon whom sections had been done for moderate degrees of pelvic contraction, had subsequent spontaneous labors, and occasionally patients are encountered who alternate between sections and spontaneous labors. In such cases the decision to operate has depended entirely upon the degree of disproportion, as it may happen that a large child will require radical intervention, while a smaller one will be born spontaneously. I mention this fact for two reasons, first, to illustrate the necessity for individualization in our indications, and for basing our decision upon the degree of disproportion rather than upon the absolute size of the pelvis; and, second, to impress upon you that in our material the fact that a patient has once had a cesarean does not necessarily imply that she will require others in the future. Naturally, such a statement applies only to moderate degrees of pelvic contraction, for when the deformity is excessive there can be only one decision, and in such cases it only remains to decide how often section should be repeated before sterilization becomes advisable.

This brings us to the consideration of the strength of the uterine cicatrix, and the probability of its yielding in subsequent pregnancies. That this is a real danger is shown by the fact that we have operated upon five such patients with two deaths, and we must bear its possible occurrence in mind whenever a patient becomes pregnant after cesarean section. That we regard it as relatively unlikely is shown by what has already been said, but whenever we learn that the puerperium following the section has been febrile, we assume that the cicatrix is imperfect and advise repetition of the operation. Likewise, it is occasionally possible to palpate a deep vertical furrow on the anterior surface of the uterus, which may justify a similar conclusion.

On the other hand, a rupture occurring in one of our patients, whose previous puerperium had been normal, teaches us that all such rules have their limitations and that the accident may occur when least expected. For that reason, all patients pregnant after sections should be carefully watched during the last three months, and be directed to report at once upon the detection of the slightest abnormal abdominal sensation. This may make possible the prophylactic treatment of a threatened rupture or the early radical treatment of an actual one; but, in spite of all we can do, it must be remembered that unexpected ruptures will occasionally occur even in women who are awaiting the approach of the time set for a repeated section. And it is this possibility which should make us hesitate to resort to cesarean section except upon perfectly valid indications, and it is my conviction that there are many throughout the country who do not appreciate this obligation.

From what has been said it is evident that I believe that each year large numbers of cesarean sections are done unnecessarily, and it is my conviction that the profession at large does not appreciate the mortality connected with it. It is customary to assume that it is comparable to that of an interval appendix operation, namely, less than one per cent. It is true that such results are obtained in certain institutions, which are directed by those who are well acquainted with the technic of the operation, and particularly with the time at which it should be performed, but this does not apply to hundreds of hospitals throughout the country, where if the truth were known it would be found that the average mortality approaches ten per cent. That this is not an exaggeration is shown by the investigation into the causes of maternal mortality in childbirth in Massachusetts, which was undertaken by the medical society of that state in 1921, when it was found that cesarean section ranked next after puerperal infection as a cause of death; while F. S. Newell, professor of obstetrics at Harvard, does not hesitate to state that in many of the small hospitals in that locality the mortality is appalling.

Why is this the case, when the country is equipped with hundreds of hospitals in which the operative and aseptic technic are excellent, or at least reasonably satisfactory? The answer, I believe, is to be found in the fact that the profession has not yet learned that the mortality from the classical cesarean section is low only when it is done at an appointed time at the end of pregnancy, or during the first few hours after the onset of labor, and that it increases rapidly with each hour elapsing after that time, to reach ten or more per cent when done during the second stage of labor. This means that emergency classical sections are always dangerous, and that those who resort to them are assuming a heavy responsibility.

On the other hand, the ideal consists in so studying one's patients during the last months of pregnancy that the necessity for interference is recognized in advance, whereby it becomes possible to make the procedure elective and to do it at an appointed time, before an "ascending infection" has had an opportunity to develop and to cloud the prognosis.

Furthermore, I believe that the easy technic and the glamor associated with the operation leads many to choose it as the easy way out of any obstetric complication. I am fond of telling my students that any one with two hands and a few instruments can do a cesarean section, but that it frequently requires great intelligence not to do it. Furthermore, I always take more pride in demonstrating a patient who has had a spontaneous labor through a "borderline" contracted pelvis than one who has been delivered by section; as the decision not to operate requires considerable intelligence and long experience in determining the degree of disproportion, and indicats that one is a skilled obstetrician and not a mere operator.

I am sufficiently optimistic to believe that the abuse of the operation is a transient phenomenon which will be slowly corrected, as better facilities for obstetric instruction develop throughout the country and more young men are turned out from our clinics with a proper appreciation of the problems of clinical obstetrics and with the realization that any operative interference, which is not clearly indicated and which experience shows does not contribute to the wellbeing of the patient, is unworthy of their training. Until that time comes, it behooves all of us, whenever we are tempted to resort to cesarean section upon ill founded indications, to remember that the underlying principle of all medical treatment is not to do harm—*primum non nocere.*

LIMITATIONS FOR THE CESAREAN OPERATION*

Alfred Baker Spalding, M.D.
SAN FRANCISCO, CALIF.

As many women in complicated labor are frequently successfully delivered by cesarean section and as this comparatively easy surgical procedure has supplanted certain very difficult obstetric operations, such as high forceps and pubiotomy which are generally conceded to be detrimental to both mother and baby, it can quite reasonably be asked, why should there be limitations for the operation. As a matter of fact, some obstetricians deprecate conservatism and advocate extending the indications for cesarean section, and many are well rewarded in private practice for lauding the practical advantages of the operation. Fortunately, however, some conservative teachers, such as Williams[1] of Baltimore, Newell[2] and DeNormandie[3] of Boston and Holmes[4] of Chicago, have drawn attention to the abuse of cesarean section and have demonstrated that in some conditions the patient is such a poor operative risk, as for example in eclampsia, that in place of being beneficial, the operation is distinctly harmful.

For ten years it was my good fortune to serve as the obstetric head of the University of California and for the past fourteen years as the obstetric and gynecologic head of the Stanford University School of Medicine. During this time there have been under my supervision the clinic patients confined in the University of California Hospital, Lane Hospital, San Francisco Hospital and the San Francisco Maternity. These case histories have been carefully studied at different times for the purpose of evaluating the ever changing clinical opinions in regard to various procedures advocated for the relief of the women in labor.

At one time cesarean section was so much of a novelty that nearly three hundred local practitioners assembled to witness my first operative clinic, when as director of the then recently organized San Francisco Maternity, I delivered by cesarean section a rachitic dwarf. This was in the old Lane Hospital on September 6, 1904. At that time, probably not more than one cesarean section was done in several hundred confinements. At present the operation is so popular in San Francisco that in some private hospitals more than ten per cent of all deliveries are by cesarean section. My impression is that a similar situation exists in New York, Buffalo, Boston and Chicago. There must be many thousands of living women who carry with them the scars of cesarean section and probably about one-tenth as many dead women are also so adorned. Very scant consideration from a clinical point of view has been given to this increasing group of cesareanized women and no comprehensive medical survey of them has ever been made.

One of my students recently reviewed the Board of Health birth records of 2000 consecutive confinements to estimate the percentage of San Francisco women who go to hospitals for their confinements, and found that 1418 or 71 per cent were confined in hospitals. Less than one-third of all patients were delivered by specialists in private or clinic hospitals and only 8.5 per cent were cared for by midwives. This led to a study of hospital reports to ascertain the general frequency of cesarean section in San Francisco. Unfortunately, most hospitals publish propaganda reports filled with statistics of donors and the names of former pupil nurses, giving very scant information as to what was done for or what happened to the patients for whom the hospital was built.

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* Read before the Thirty-fourth Annual Meeting of Idaho State Medical Association, Sandpoint, Ida., Sept. 2-4, 1926.

However, it can be seen from the very meager statistics presented in Chart One that there has been a constant increase in the frequency with which patients were cesareanized in San Francisco during the years 1912 to 1918. In 1918, Stanford Hospital, devoted exclusively to the care of private patients, was opened to the general profession of San Francisco. Since that date, 38 general practitioners, 33 obstetricians and gynecologists, 7 surgeons, 2 anesthetists, 1 pediatrician, 1 urologist and 1 roentgenologist have confined patients in the hospital to the number of 2020, with a total mortality of 13 or 0.6 per cent and a fetal stillbirth mortality of 43 or 2 per cent. On the 2020 patients, 160 cesarean sections were performed, or 1 in 12 patients, with a maternal mortality of 4 or 2.4 per cent and a fetal stillbirth mortality of 7 or 4 per cent. With one exception, all the cesareans were performed by obstetricians or gynecologists and the patients were very probably carefully studied before operation.

With these facts in mind, it is interesting to note the list of indications for which the operation was performed (see Chart Two), and to note the maternal and fetal mortality. This chart shows the increase in maternal mortality, when the operation is done for seriously ill patients as shown in Group I, and off hand one might conclude that the illness often times should more properly be charged with the mortality. That this is not always true was demonstrated by one of my students who reviewed the private and clinic records of Stanford, Lane and the San Francisco Hospitals for a group of 51 patients with eclampsia. In this group, 12 were treated by abdominal and 2 by vaginal cesarean section, with a maternal mortality of 28.5 per cent, while 37 were treated by spontaneous labor, forceps or version with 7 deaths or 18.9 per cent. Moreover, the fetal mortality with the cesarean group was 28.5 per cent, while with the second group the fetal mortality including one craniotomy was only 12.2 per cent.

CHART ONE

YEAR	HOSPITAL		CONFINEMENTS	CESAREANS	RATIO
1912	St. Marys	Pr.	127	1	1 in 125
	St. Lukes	Pr.	54	0	
	Lane	Cl.	319	3	
1913	Lane	Cl.	426	3	1 in 142
1914	St. Lukes	Pr.	162	4	1 in 91
	Lane	Cl.	476	3	
1915	St. Marys	Pr.	323	16	1 in 34
	Lane	Cl.	394	5	
1916	Mt. Zion	Pr.	118	9	1 in 45
	U. C.	Cl. & Pr.	276	7	
	Lane	Cl.	424	4	
1917	U. C.	Cl. & Pr.	322	9	1 in 43
	Lane	Cl.	454	9	
1918	Mt. Zion	Pr.	140	6	1 in 45
	U. C.	Cl. & Pr.	332	6	
	Lane	Cl.	441	8	
1919	U. C.	Cl. & Pr.	333	6	1 in 75
	Lane	Cl.	342	3	
1920	U. C.	Cl. & Pr.	459	8	1 in 39
	Lane	Cl.	331	12	
1921	U. C.	Cl. & Pr.	561	12	1 in 48
	Lane	Cl.	311	6	
1922	U. C.	Cl. & Pr.	409	9	1 in 45
	Lane	Cl.	319	7	
1923	U. C.	Cl. & Pr.	378	17	1 in 29
	Lane	Cl.	373	9	
1924	U. C.	Cl. & Pr.	406	7	1 in 45
	Lane	Cl.	363	10	
1925	U. C.	Cl. & Pr.	404	8	1 in 40
	Lane	Cl.	359	11	

CHART TWO

INDICATIONS	NO.	MORTALITY	
		MATERNAL	FETAL
Toxemia & eclampsia	47	3	2
Myoma uteri	7	..	..
Abnormal heart	4	..	..
Vomiting (24 week)	1	..	..
Tuberculosis	6	..	..
Placenta previa	3	..	..
Placenta ablatio	2	..	1
Total Group 1	70	3 4.2%	3 4.2%
Abnormal pelvis	33	1	1
Previous caesarean	32	..	2
No engagement	15	..	1
Comp. lac. perineum	7	..	..
Old primip	1	..	..
Ventral fixation	1	..	..
Illegitimate	1	..	..
Total Group II	90	1 1.1%	4 4.4%
Total	160	4	7
Per cent		2.5%	4.4%

In the clinic service of Lane Hospital there were 93 cesarean sections in 3772 confinements, or one for each 40 deliveries. With these 93 cesareans there were six deaths, giving a maternal mortality of 6.4 per cent as compared to 1.2 per cent mortality with all other types of operative delivery and 0.19 per cent mortality with spontaneous labor. Three of the six cesarean deaths were associated with eclampsia and one with acute milliary tuberculosis, leaving only two maternal deaths chargeable to cesarean section or a mortality of 2.1 per cent.

These experiences will illustrate the most evident indication for the limitations of cesarean section, namely, eclampsia and nephritic toxemia. Occasionally there is a toxemic patient well treated by cesarean section but usually the patient does best. if all operative efforts at delivery are delayed until by medicinal treatment she has been rendered less irritable to her toxines. This is difficult to do in San Francisco because the laity has been educated to believe that, immediately a convulsion intervenes, the "belly should be cut."

At the present time, considerable discussion has arisen in regard to the advisability of cesarean section for the treatment of antepartum bleeding. Here, again, there is the young primipara, with a closed cervix and a central placenta previa, with delayed coagulation time and marked anemia, who probably would die if attempts were made to deliver her by packing, version or cervix bag. Cesarean section may posibly save her life, but in general practice the usual case of bleeding, treated with the Vorhees' bag, or by Braxton Hicks version, does better, provided the baby is slowly extracted than if she were hurriedly prepared and delivered by laparotomy.

In 1910[5] I found about 8 per cent of contracted pelves with clinic patients in San Francisco, 60 per cent of whom delivered themselves normally with practically no maternal or fetal mortality. Of the 40 per cent requiring operation for delivery, however, there was 23 per cent fetal mortality, due to the fact that cesarean section at that time was not done frequently enough. Today, there is no doubt that many patients with minor degrees of outlet contraction are being delivered by cesarean section who would deliver themselves safely if let alone. But because of the danger of complete laceration and of fetal head injury, most obstetricians in San Francisco advise cesarean section if the outlet is noticeably contracted. Moreover, when there is apparent obstruction at the brim, due frequently to malposition of the baby, I believe many needless cesareans are done. Private patients dislike a prolonged or protracted first stage of labor. Doctors have become oversensitive to the dangers to the baby of morphine, chloral, bromides, ether by rectum, etc., and too many mothers complain to their friends later because of long labor and unjustly blame their conscientious attendants.

With pelvic disproportion there is always relative indication for cesarean section but with malposition, either breech or occiput posterior, the indication that I have most frequently observed is the fear of the attendant that he is incompetent to safely extract the child by vagina or to avoid serious maternal laceration. A woman surgeon in San Francisco once wrote a paper, advocating cesarean section for frank breech presentation because she lost the baby through attempting breech extraction. Some years later, a young male surgeon saved the baby but lost the mother from peritonitis on the seventh day by resorting to cesarean section for frank breech presentation in an elderly primipara. I saw both these patients in consultation and the experience has impressed me with the idea that it is better for the general practitioner to attempt vaginal delivery and lose the baby than to attempt abdominal delivery and lose the mother.

A colleague recently asked me to see a primiparous patient who had been in labor for some hours with a left occiput posterior. The pelvis was normal and to me it seemed there was evidence of settling almost to the spines but to him there was disproportion because the head could be dislodged to the brim with slight pressure. He delivered successfully by cesarean section.

Some years ago, a private patient came to me late in pregnancy who was very nervous and apprehensive with a christian science mentality, and insisted upon being delivered by cesarean section because her mother had had a very hard and difficult labor. She died on the seventh day from peritonitis and autopsy showed that there existed a primary Neisserian infection of the cervix. As one of the limitations for the cesarean operation, an inspection of the cervix with slide examination has been routine in my clinic and private practice since that time.

Nicholson,[6] Professor of Gynecology at the Jefferson Medical College, recently reported the experiences of the midwives of Philadelphia County, Pennsylvania, who delivered under supervision 51,693 patients over a period of seven years. All but 34 patients were delivered in their homes, and with only 1468 were the midwives assisted by doctors. From all causes there were only 62 maternal deaths or 0.12 per cent mortality, which is more remarkable when one notes that 12 or one-third the total deaths were due to the epidemic of influenza. Of 52,033 babies born only 1309 were stillborn or died later, giving a total fetal mortality of only 2.5 per cent.

It has been said that these midwives obtained such a good result because they accepted only the normal cases. This, I believe, can hardly be true, as midwives as a rule do not examine their patients during pregnancy. They have no pelvimeter or stethoscope, nor have they any preconceived ideas regarding prophylaxis. They accept labor as it exists and rely on time, patience and the natural forces to accomplish their results. Being under supervision, they are limited in activities that lead to pelvic infection through improper examinations during labor.

Overenthusiastic specialists in obstetrics frequently advocate cesarean section and other operative interference for what might well be called ghosts. By this I mean they devise operations for the treatment of conditions that do not actually exist but which may develop at some future time, should the prophylactic operation recommended be disregarded. I have seen hemorrhagic disease of the newborn produce fatal intracranial hemorrhage in a baby delivered by cesarean section. Had this baby been delivered by vagina, the cause of the fatality would undoubtedly have been credited to the limitations for cesarean section. A specialist some years ago delivered a prominent woman in San Francisco by low forceps of a baby that later proved to be an idiot. At the succeeding confinement a competitor delivered this same woman by cesarean section of a normal baby, much to the discomfort of the first attendant. Neurologists and pediatricians, by calling the attention of obstetricians to the possible dangers of intracranial lesions to babies delivered by vagina, have created many ghosts in the fertile minds of alert obstetricians, the treatment of which most frequently calls for cesarean section.

Why should women face a vaginal delivery, when the baby can so readily be delivered by laparotomy? In San Francisco the obstetric patient is particularly well cared for by both specialists and general practitioners. Seventy-one per cent are confined in hospitals, one-third of whom have practitioners who limit their work to obstetrics or to obstetrics and gynecology and comparatively few employ midwives. The general maternal mortality is less than half of one per cent and the fetal mortality averages 6.5 per cent. In general practice very few cesarean sections are performed, so far as available records show. In the teaching hospitals about one patient in forty to fifty deliveries is treated by cesarean section, but in many of the private hospitals the recent records show that one in every eight to ten confinements are delivered by cesarean section, mostly by obstetricians.

To estimate the obstetric maternal and fetal mortality in San Francisco, some of my students reviewed the records of the San Francisco Board of Health. They found that with 5750 births the maternal death rate was 0.42 per cent, and with 2000 births the fetal mortality was 6.5 per cent, including all stillbirths and deaths occurring within fourteen days of birth. This would be a creditable record, were it not for the fact that 9 or 40 per cent of the maternal deaths followed cesarean section, the causes of death being eclampsia, 3; peritonitis, 3; embolism, 2; and nephritis, 1.

The increased danger of maternal death, estimated conservatively at about 3 per cent, is not the sole reason for calling attention to the need for reasonable conservatism in resorting to cesarean section. To anyone with even moderate surgical experience it is well known that not infrequently the postpartum patient delivered by laparotomy suffers with high temperature, with pneumonia, often times thrombotic in character, with ileus, intestinal obstruction and acute gastric dilatation, with nonfatal femoral thrombosis and many other surgical complications which are less frequently seen following pelvic delivery. These complications are not only a worry for the attendant and not infrequently interfere with the nursing of the baby, but they form the basis for future maternal ills.

As a gynecologist it is my experience to occasionally see patients who complain of abdominal pain due to the fixation of the uterus to the abdominal wall and to low grade peritonitis following cesarean section. In one such case, it was necessary for me to remove the uterus in order to relieve the discomfort. Postcesarean sterility is also a rather frequent but little considered cesarean complex. While most frequently the sterility is probably due to deliberate intention and produced by excision and ligation of the tubes, this is not always the sole cause.

Sampson has called attention to the dangers of endometrial transplants. Regardless of the technic used at the time of operation, the endometrium and myometrium are always traumatized and this sometimes results in transplantation of the endometrium ti the ovaries and tubes, causing sterility by the resulting hemorrhagic cysts of the ovary, or ectopic endometrial tumors in the tubes. Due to unavoidable trauma, there also occasionally occurs poor healing of the uterine scar and tumor formation in the abdominal wall, due to endometrial transplants. I have seen in the laboratory, sections of an abdominal wall tumor which resembled endometrial glands and have frequently observed defective cesarean scars. According to Convelaire[7] these defective scars rupture in about 4 per cent of all subsequent pregnancies which in my opinion is a conservative estimate.

This brings up for consideration, the subject of "once a cesarean, always a cesarean." I cannot agree with those who maintain that it is safe to permit the cesareanized patient to deliver herself in subsequent labors by vagina. For instance, in Stanford Hospital, among the private patients confined by San Francisco practitioners since 1918, there have been two cases of spontaneous rupture through the cesarean scar in 33 repeated cesareans or an incidence of 6 per cent. The rupture occurred in each instance several days before labor was due and while the patient was in the hospital awaiting delivery. One patient was a young woman who had been delivered by her attendant a year previously by a so-called conservative cesarean section but unfortunately the baby died. When the uterus ruptured her doctor performed a hysterectomy, thus completing probably one of the saddest tragedies that can hapen in obstetrics—a young woman sterilized and childless, although having twice carried a child to full term!

Some years ago Von Leuwin[8] found reported in the literature six ruptures which occurred in sixty-six labors after cesarean section or an incidence of 9 per cent. With the low retrovesical cesarean section, ruptures are much less frequent and some operators state that they have never occurred. In general practice, however, very few retrovesical operations are performed because they are distinctly more difficult to do than the usual midline cesarean section. There is no doubt but that the well healed cesarean scar is strong enough to withstand labor pains and probably some defective scars will also not rupture, unless they are dilated by the bag of waters as I suggested some years ago in a paper on cesarean section scars.[9] But until it can be demonstrated in the nonpregnant woman by uteroscopy or some similar method just who has the weak scar, I believe it is safer in the long not to trust to chance but to recesareanize the cesareanized woman. This means that greater thought and more conservatism should be shown in doing a preliminary cesarean section in a young woman.

In spite of all that has been said against cesarean section, it is when properly indicated so valuable an obstetric procedure that the man in general practice must always keep in mind the imperative demands of the family or consultant and so conduct labor that the operation can never be absolutely contraindicated. While the usual high midline cesarean section is easy for a general surgeon to perform, he should never be called in consultation unless he has had good obstetric training and has obstetric judgment. The technic of the low cesarean section requires some special training properly to perform, and the judgment needed to decide when the operation is properly indicated is obtained only by fairly extensive obstetric experience. It is much less difficult to decide correctly against the operation than correctly to decide for the operation, and I have more than once known midwives to outsmart the professor of obstetrics by successfully delivering by spontaneous labor patients whose records showed the signed recommendation for cesarean section. The man in general practice will be wise if he treats the young primipara conservatively and permits nature to help him all she can before he casts his cigar away and discards his time honored obstetric state of masterful inactivity.

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Stanford Hospital.

INTERRELATIONSHIP BETWEEN PATHOLOGIC CONDITIONS OF THE MOTHER AND OFFSPRING*

Fred L. Adair, M.D.
MINNEAPOLIS, MINN.
Associate Professor of Obstetrics and Gynecology
University of Minnesota Medical School

The exact relationship between the fetus and the mother is only partially known. We know, of course, that the fetus must receive its nutriment from the mother who in turn must dispose of the waste products of fetal metabolism. The physiologic relations between these two beings are only incompletely understood, and of the pathologic we know even less.

The growth and development of the fetus depends on the obtaining of the necessary material, including water, inorganic and organic substances, from its mother. This in itself is not sufficient, as the fetal organs must utilize these materials for the upbuilding of its own structures. The human ovum, unlike the egg of many animals, does not supply sufficient nourishment to carry through even the early embryonic life. Very soon after fertilization takes place the ovum must find a suitable resting place in the maternal tissues or perish. It may come to rest in some maternal tissues which permit of its early development but are not consistent with its later and normal development.

We see this well illustrated in tubal pregnancy, where the maternal tissues are not well adapted to the implantation and development of the embryo. As a result we have not only frequent maldevelopment of the embryo, but also undue invasion with erosion and destruction of maternal tissues, leading to tubal rupture with embryonic death and serious injury to the mother. Even in those cases, where the implantation is sufficient to permit of the fetal growth, it is rare that the development goes to term. It more commonly happens that the fetus dies and is retained, and eventually becomes a lithopedion. It frequently happens that embryonic and fetal development are not normal and monstrosities are formed.

The fact that rarely a fetus may be developed normally outside the uterus and be delivered alive proves that certain maternal structures, such as the uterine wall, including the decidua, are not absolutely vital for the proper nutriment of the growing embryo and fetus. This represents one type of pathologic interrelationship which usually results in malformation and death of the embryo or fetus and is commonly associated with danger to, and occasionally death of the mother.

The ovum may pass into the uterus normally and become properly implanted in the uterine mucosa where it may develop abnormally, leading to the formation of a pathologic embryo which is incapable of further development and is cast off in an abortion. This may have been due to some defect in the germ cells or may have resulted from some environmental condition affecting the implantation. This abortion is, of course, associated with the destruction of the embryonic or fetal life and carries with it a menace to the life of the mother from hemorhrage and infection. Sometimes the prospective mother has repetitions of these abortions of pathologic embryos, giving rise to the condition known as habitual abortion. It has also been shown experimentally that, if animals are deprived of certain food elements or vitamins, such results as above outlined may be brought about, thus indicating that not only local conditions but also systemic disturbances have an effect on early pregnancy. Similar facts are brought out by the results of lead poisoning on pregnant women, who become subject to abortion as a consequence of absorption of this toxic mineral substance.

Normally there is a balance between the growth of the invading fetal cells or the trophoblastic layers and the resistance from the maternal cells and tissues. Sometimes this relationship is disturbed and we have tremendous development of the chorionic villi usually associated with fetal death, rapid distention of the gravid uterus, hemorrhage, and danger to the prospective parent. Nor is this all, for in a definite percentage of these hydatidiform moles we are confronted with the menace of the chorioepithelioma maligna, which usually has a fatal termination for the mother.

The question comes up as to whether or not the fetus is a parasite and lives and develops to the detriment and at the expense of its maternal host. In some cases it would seem as if this were true, and yet in other instances the mother seems to receive a certain impetus and stimulus from the pregnancy so that she enjoys a state of health better than previously experienced. It is probable, therefore, that mother and offspring live in a state of symbiosis and that generally the pregnant state is on the whole one of mutual benefit to them.

We see not infrequently one of the deleterious effects during early pregnancy. This is manifested by the nausea and vomiting of pregnancy which at times becomes excessive and even toxic. It then becomes pathologic for the mother and may in intractable and serious cases necessitate the sacrifice of the embryonic or fetal life. Whether this upset is due to some metabolic or endocrinal disturbance or to the elaboration of some fetal toxin is, of course, unknown, but there is some interrelationship between the maternal and fetal organism which is responsible for the development of this pathologic condition. We do not know whether the glycogen reserve is pulled down by the unusual demands of the fetus, nor do we finally accept the theory of specific ferments and syncytic toxins, nor are we definitely convinced that the pituitary and adrenal glands are responsible for this maternal nutritional breakdown, resulting from the continued expulsion of fluid and food. The mother is the one who suffers mainly for, if she survives, the fetus seems to develop and make its appearance normally at term.

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Of infections in the mother which may be transmitted to the embryo or fetus early in its life we know but little. We have the biologic evidence of the epidemic abortion in cattle, of which we have no definite counterpart in the human. Yet there are many abortions which are difficult to explain, which occur quite frequently and at times repeatedly in the individual without demonstrable cause. It is not at all impossible that some obscure infection may account for some of the embryonic and fetal deaths. As the embryo develops into the fetus and as this organism gradually develops its organs and structures more completely, the pathologic changes are easier to detect, at least those which are morphologic rather than physiologic. Even in the adult structural changes are more readily demonstrated than those of function. Both are much more difficult to investigate in the fetus, which leads an isolated intrauterine life. We can obtain some idea of the morphologic changes taking place in the fetus by a study of the tissues of those which are born alive but die shortly afterwards and of those which die before birth. In the latter group these studies are often unsatisfactory because of the postmortem changes which have already taken place at the time of birth.

We can use gross pathologic methods for the study of these cases, using special technic which is adaptable to an investigation of these cases. This is especially important in the examination of the fetal head. We can also use microscopic sections with special staining technic, such as the Levaditi method. The x-ray has proved of definite value, especially in the study of skeletal changes, where epiphyseal and other alterations may be visualized.

When it comes to a functional study we are practically limited to analysis of the amniotic fluid, occasional small specimens of urine, fetal blood obtained from the cord and meconium. In a study of the physiology of various fetal organs we are almost at a loss to know how to proceed. We know from morphologic study that the functions of nearly all organs of the fetus must be radically different from those of the adult.

Naturally it is impossible to know either the morphologic or physiologic variations until the normal is understood. We are not in a position to understand the effect of alterations in maternal structure and function upon the fetus nor of the changes in the morphology and physiology of the fetus upon the parent, until our knowledge is much more complete than at the present time. It is only necessary to enumerate a few of the fetal organs and structures to understand how different the physiology of the organs must be from that of the adult.

The gastrointestinal tract with the accessory glands, such as the liver and pancreas, must have entirely different functions to perform in the fetus and adult. The difference in the lungs is so obvious as hardly to need mention. The heart functions similarly in both but with enormous differences. The kidneys are different. The endocrines, about which our knowledge even in the adult is so incomplete, present marked morphologic differences which must be associated with physiologic variations. The thymus and thyroid are two important organs which may fall in this group of the endocrine glands.

The thymus apparently functions as a lymphoid organ, and if there is an internal secretion, it has not been conclusively demonstrated. That it is an important organ in fetal life is amply indicated by its increase in size during this period of life. That it has little to do in adult life is shown by the steady atrophy after birth. It is subject to great variation in size during fetal and newly-born life and shrinks rapidly under inanition. The broad thymus of fetal life changes to the narrow one of postnatal life and is associated with moulding and alteration of position, due to the expansion of the lungs at birth. This may give rise to respiratory stridor, choking spells, and cyanosis in the newly born. Similar symptoms much more commonly result from intracranial birth injury. So far as we know there is no definite interrelationship between maternal conditions and thymic variations in the fetus. The facts that this gland is apparently so essential to the fetus and yet so variable in size, and that it is so unimportant to the adult rather indicate that the variations are due to some outside factors operating through the mother. It atrophies so quickly when the organism is undernourished that it may have some rôle to play in connection with certain essential growth conditions. We are so much in the dark on the larger problem of the effect of nutriment given the mother on fetal development that we can hardly be expected to have solved the problem of the thymus.

In regard to the nourishment of the mother and the relation to the growth of the fetus, we are still at sea. We have the problem of the undernourished and of the obese mother as well and must consider the effect of these conditions on the fetus as well as upon the mother. It is no doubt true that the embryo and fetus take up nourishment at the expense of the mother and that we can really influence the size of the fetus very little short of actual inanition of the mother. It is very probable that there are certain minimal dietary protein requirements to meet the actual growth and maintenance needs of the mother and fetus. It is also probable that there is a certain amount of substitution necessary as between fats and carbohydrates. It is, however, in the inorganic salts requirements of the fetus that we may be especially apt to encounter difficulties which may lead to serious consequences.

It is, of course, well known that the thyroid gland is in some way closely related to the genital system, especially in the female. We frequently observe the enlargement of this gland which takes place during pregnancy. It has also been shown that hypothyroidism has a definite effect in diminishing the powers of procreation, in the female at least. It is, of course, now well known that iodine deficiency is related to goiter formation. This brings up the question of the interrelationship between the hypertrophy of the maternal thyroid and fetal growth. There is also the question as to whether or not the administration of iodine to the pregnant woman might not prove beneficial to the fetus, especially in those sections of the country where the population suffers more or less from iodine deficiency. It seems that the administration of iodine during infancy and childhood is more efficacious in preventing goiter than when given during later life. It might well be that the administration of iodine during pregnancy would have a more beneficial and lasting effect on the offspring than if given during extrauterine life. The thyroid gland has been studied microscopically in our laboratories by Dr. C. A. Stewart, who has made the following observations:

"A study of the thyroid glands from a series of approximately three hundred new born infants revealed a very striking variability not only in the size of the glands, but also in their histologic appearance, particularly of the thyroid follicles. The study also has revealed a series of changes which have been interpreted as being suggestive of the occurrence of definite progressive stages in the changing histologic structure of the gland. Although this interpretation may be erroneous, nevertheless for descriptive purposes the different histologic pictures observed are considered in the apparent order of their progression. In this abstract glands presenting four distinct and different types of histologic structures are described.

"Type I. In a certain percentage of newborn infants the thyroid gland presents well defined follicles of various sizes lined with low cuboidal epithelium. In glands of this type the majority of the follicles contain colloid. Surrounding the follicles is a vascular and delicate stroma of connective tissue. In general the appearance of these glands is quite comparable with that of the normal adult human thyroid. Thyroid glands of this type occurring in the newborn infant are uniformly small, weighing from one to two grams, and were found in the minority of cases. If this type of gland is normal for the newborn infant, there can be no doubt that at birth the thyroid is abnormal in the majority of babies born in Minneapolis.

"Type II. In glands of this type a hyperplasia of the follicular epithelium has occurred, and to such an extent that the lumina of the follicles are compactly filled with cuboidal cells. This hyperplasia of the follicular epithelium is accompanied by a complete disappearance of the colloid. Thyroid glands showing this type of histologic appearance occur more frequently at birth than Type I. In addition the gross weight of the glands of Type II averages about treble that of the thyroids showing definite colloid containing follicles. In a considerable number of the infants the thyroid presented this appearance.

"Type III. Thyroid glands classified in this group had an average weight definitely greater than that of the first two types described, ranging from six to fifteen grams. The thyroids in this group resemble those of group II in presenting follicles containing no colloid and being filled with epithelial cells. Careful examination reveals, however, that instead of being compactly arranged the epithelial cells are separated by definite intercellular spaces. In addition the cytoplasm of the epithelial cells is definitely less abundant in glands included in group III than in group II. Accompanying the appearance of the intercellular clefts or spaces the cytoplasm of the epithelial cells appear drawn out in delicate processes in such a manner as to suggest the appearance of mesenchymal tissue.

"Type IV. The thyroid glands of this group included quite uniformly the largest glands present in this series of babies, ranging in weight from fifteen to seventy-two grams. Thyroids of this type present rather large follicles containing no colloid. Remnants of follicular epithelium are scattered loosely throughout the follicle with only an occasional cell attached to the periphery of the follicle. The cytoplasm is greatly reduced in amount and presents fine,

> delicate protoplasmic strands apparently anastomosing frequently with those of adjacent cells. Thyroids showing this type of histologic structure are usually considerably hypertrophied and also are rather frequent in occurrence.
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> "Type IV. a. The thyroid glands included in this group probably should be included in group IV, but for convenience of description are considered separately. The glands in this group contained follicles histologically similar to those in group IV and differ only in the presence of extreme congestion of the gland. The congestion in addition to greatly distending the capillaries of the stroma of the gland also greatly distorted the contour of the follicles.
>
> "The variations in the histologic appearance of the thyroid of the newborn infant are so extreme that one not familiar with these variations experiences great difficulty in recognizing the gland."

We, of course, do not know what the subsequent life history of these thyroid glands might have been, nor do we know what effect, if any, the giving of iodine to the mothers during gestation of these newly born infants would have had. It does seem as though the fetus had some effect on the maternal thyroid and without doubt there is some purposeful result of this hypertrophied gland and its secretion on the fetus. Iodine has been found in the fetal thyroid and, while ordinarily this gland does not function in the fetus, it has been demonstrated experimentally that the fetal gland can take over the function in the absence of the maternal thyroid.

Another important salt is that of calcium, which is essential to the mother and vital for the proper development of the fetal skeleton. The fetus draws upon the mother for this substance and evidently secures it even at the expense of the mother in case of deficiency. We rarely see fetal or intrauterine rachitis, though such cases have been reported. Apparently there is considerable diversity of opinion as to whether or not the softening of the bones seen in newly born infants is or is not true rickets, but the condition is probably dependent upon deficient calcium and phosphorous metabolism and readily yields to antirachitic therapy. The mother suffers from calcium deficiency and in extreme and rather unusual cases we see manifestations of osteomalacia. There are doubtless lesser disturbances with skeletal structures and the teeth of mothers who are on a calcium deficient diet or who have a disturbed calcium metabolism. Here we are dealing with pathologic conditions which may be brought about through the demands of the fetus for more calcium than the maternal tissues can supply, with detrimental results for mother or fetus or both. The measures which may be taken to prevent the advent of such conditions are the supplying of calcium-bearing foods and furnishing of stimulators of calcium metabolism.

Iron is required by the fetus and is derived from the hemoglobin and tissues of the mother and stored up in reserve in the fetal tissue against the time when the fetus may draw upon it to make up for the deficiency of this material in the mother's milk. This may be connected with some of the anemias of pregnancy.

It is not necessary probably to go into further detail regarding the inorganic materials which are needed by the fetus. The above citations give an idea of the interrelationship in mineral metabolism and suggest some of the pathologic conditions which may result from perversion of these functions. The inorganic salts pass through the placenta freely as does water, as if it were a partially permeable membrane, and the principles of osmosis in general govern the transmission of nutritive substances from the maternal to the fetal blood.

The same holds true with relation to the amino acids, from which the fetal proteins are built, and for glucose which supplies energy. Pathologic relationships from disturbed metabolism of these substances are not clear cut or worked out, but they may have something to do with the so-called toxemias of pregnancy.

Vitamins are essential to life and health, but fortunately are widely distributed in fresh foods. From some work of Schultz, Palmer, and Kennedy, it has been shown that these substances may be transmitted through the blood stream and be eliminated in the milk. It is equally probable that they are transmitted through the placenta and that thus the fetus receives this material which is so vital to its health and life. It is quite possible that disturbances of some of these interchanges may be responsible for some of the obscure conditions found in fetal pathology.

The toxemias have been mentioned and it is perhaps important to consider the one known as eclampsia. There are many theories regarding the causation of this condition. It is commonly supposed to be of intrauterine origin, meaning, of course, from the fetus or fetal structures. Wherever the origin, the toxin reacts unfavorably on both mother and offspring, as the latter not infrequently dies. In our series of antepartum stillbirths, syphilis and toxemia were the big factors which caused intrauterine deaths and fetal maceration.

As you know, the placenta is frequently affected in these toxic conditions. The degenerative changes are so constant as to lead some observers to believe that certain placental toxins are responsible for this disease. This view we are not inclined to accept, but we feel that the placental changes are the result rather than the cause of eclamptic toxemias. In some cases the degeneration of the placenta is so marked as to lead to fetal death. In other instances the fetus seems to succumb from the direct effect of the toxin. As is well known, the mother suffers severe damage and sometimes even death from this poisoning. The interrelationship here is very striking as well as serious, and while the effect on the mother is generally appreciated, the result for the fetus is not so commonly recognized.

The results of infection in the mother are not so easily demonstrated except in a few striking instances, such as syphilis and variola. The dire results of luetic infection on both mother and fetus are quite well appreciated, and while there is much to be learned, we have advanced much further in our understanding of these problems than in many others. It is usually thought that syphilis is a common cause of early and repeated abortion, but such does not seem to be the case. The manifestations usually occur later in gestation and more especially after the sixth month. The infection is as a rule transmitted from the mother to the fetus, though rare cases of fetal infection from the father may occur. Treatment is interesting because the treatment of congenital syphilis has been such a notable failure. On the other hand, the treatment of the pregnant woman, beginning early in pregnancy if possible, yields very satisfactory results so far as the mother, and especially the fetus are concerned. It would, of course, be better to secure a cure before the conception took place, but it is much better to treat during pregnancy than subsequently and the earlier treatment is instituted the better.

In this connection the problem of the transference of immunity from the mother to the fetus is of interest. No doubt the fetus which survives an intrauterine attack of variola acquires an immunity, but we have been able to show in our clinic (Urner) at the Minnenapolis General Hospital that vaccination of the prospective mother does not confer immunity to the fetus even for vaccinia. It is dangerous to generalize, but it looks as though the fetus could not acquire immunity from its mother to infectious disease which affected the mother during pregnancy. Vaccination of unvaccinated pregnant women is highly desirable, especially in the presence of an epidemic, as it saves both maternal and fetal lives and in our experience is not associated with any untoward results in pregnant women.

MATERNAL MORTALITY

A STUDY OF TWENTY-TWO CASES OCCURRING AT THE SWEDISH HOSPITAL IN FIVE YEARS*

HARRY H. KRETZLER, M.D.
EDMONDS, WASH.

Medical literature in the past few years has abounded in articles decrying the work of the American physician in the field of obstetrics. There have also been a number of lay articles on the subject of maternal mortality. In view of the general interest aroused by these articles a study of the maternal mortality at the Swedish Hospital, Seattle, was made for the five years, 1921 to 1925 inclusive. During this time 3.017 mothers were confined, of whom 22 died in the hospital. Every woman six months pregnant or over is included in these figures. The maternal mortality is, then, 0.72 per cent, or in terms of the Bureau of Census 7.4 per 1,000 live births. The hospital vital statistics are shown in Chart I.

This figure is higher than that of the country as a whole. In 1921 the maternal mortality was 6.5 per 1,000 live births. Over a similar five year period in the state of Washington the rate was 6.8. The higher rates in hospitals are due to the hospitalization of cases that would ordinarily be delivered at home. When complications ensue, patients are taken to a hospital in an effort to give them more careful attention, as well as to give them the benefit of equipment and assistance which obtain there. Furthermore, cases are included in the hospital reports which are not included in ordinary statistics.

The record in regard to stillbirths is above the average. In twenty years in Massachusetts the rate has never fallen below 35 per 1,000 live births, and other statistics (DeLee, Cragin) range up to 50. The rate for the state of Washington during the same period is 30 per 1,000 live births, identically the same as the rate in the hospital.

From Chart II we can get the data on the cases that have died. The average age was 32.1 years. There were twelve primiparas, three in their second pregnancy, three in their third, one in her fifth, and one in her sixth. Two were not stated. In the fourth column we note that there were three postmortems, 13 per cent of the total number. In the fifth column the fate of the child is stated. There were seven stillbirths and fifteen live births. Two of the latter group died in the hospital after delivery.

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* Read before the Monthly Staff Meeting of the Swedish Hospital, Seattle, Wash., April 27, 1926.

CHART I

Date	Mothers Confined	Mothers Died	Caesarean Operations	Babies Born	Twins	Prematures	Stillborn	Babies Died
1921	611	8	13	619	8	. .	15	25
1922	595	4	13	602	7	. .	16	17
1923	601	4	19	615	14	13	16	15
1924	633	6	34	642	9	14	28	12
1925	577	3	24	583	6	13	16	18
Totals	3017	22	103	3061	44	50	91	87
				Female, 1506; Male, 1555.				

Maternal mortality— 0.72 per cent or 7.4 per 1,000 live births.
Still births— 2.97 per cent.
Infant deaths— 2.84 per cent.

CHART II

							CAUSES OF DEATH							
Case No.	Age	Para	Post-Mort-em	Fetus	Duration	Operation	Renal Toxemia	Hepatic Toxemia	Hemorrhage	Embolism	Acute Infections	Hyperthyroidism, Acute	Shock	Dilatation of the Heart
1654	34	?	. .	S	Term	Version	X							
1804	40	5	. .	D	6 Mo.	Vag. Cesarean			A				X	
2042	25	1	. .	L	Term					X				
2107	24	1	. .	L	Term		X							
2122	34	1	. .	L	Term	Abd. Cesarean	A							X
2193	37	6	. .	S	6 Mo.	Abd. Cesarean	A					X		
2771	33	1	. .	S	8 Mo.			X						
3695	27	1	. .	L	Term	Abd. Cesarean	X							
4403	28	3	. .	L	Term	Abd. Cesarean				X				
4953	32	2	. .	L	Term						X			
7081	31	1	. .	S	6 Mo.			X		A				
8262	29	?	X	L	Term	Abd. Cesarean	A		X					
9591	42	2	. .	S	6 Mo.	Vag. Cesarean	X							
9909	24	1	. .	S	8 Mo.	Abd. Cesarean			X					
9939	30	3	. .	L	8 Mo.	Abd. Cesarean	X							
10314	40	3	X	S	7 Mo.				X					
10356	37	1	. .	L	Term									X
11547	28	1	X	L	Term				A				X	
12693	25	1	. .	D	7 Mo.	Abd. Cesarean	X							
13833	31	1	. .	L	Term						X			
14948	36	2	. .	L	Term							X		
14937	40	1	. .	L	8 Mo.	Abd. Cesarean					X			

The next column gives the duration of pregnancy. Twelve mothers were delivered at term, four at eight months, two at seven months and four at six months.

In the next column operative procedures were placed. These are further listed in Chart III with operative indications listed below. It will be noted that more than half of the cases had some sort of an operative procedure.

CHART III.

OPERATIONS DONE

Abdominal cesarean	9
Vaginal cesarean	2
Version	1
Total	12

INDICATIONS

Abdominal cesarean	
Toxemia	5
Hyperthyroidism	1
Hemorrhage	1
Contracted pelvis	1
Breech in elderly primipara with fibroids	1
Vaginal cesarean	
Toxemia	1
Placenta previa	1
Version	
Toxemia	1

CHART IV.

CAUSES OF DEATH

Toxemia		8
Renal type	6	
Accessory	3	
Hepatic type	2	
Hemorrhage		3
Premature separation of the placenta	1	
Esophageal varix from luetic liver	1	
Postoperative bleeding into anterior abdominal wall	1	
Accessory	2	
Placenta previa	1	
Third degree tear, cervical lacerations	1	
Embolism		2
Acute infections		3
Acute hyperthyroidism		2
Shock		2
Acute dilation of the heart		2

At this point it may be of interest, in view of the percentage of operative cases, to repeat some statements about cesarean section. DeLee, a year ago, stated, "another factor that contributes to the high maternal mortality—growing bigger every year—is cesarean section. Deaths following cesarean section in the registration area in 1920 numbered 212; in 1921, 247, and in 1922, 266. That 500 women die annually in the United States following abdominal delivery, I feel sure is not an exaggeration. In the first place it is a notorious fact that too many cesarean sections are being done. The indications are too loosely applied, and women are operated on who should not be exposed to the risks of abdominal delivery." Tottenham, of Dublin, who recently made a visit to the United States, says, in part, "unfortunately the continued influence of surgery (on the teaching of obstetrics and gynecology) seems now more harmful than otherwise, in that it has led to radical methods of treatment being instituted for certain conditions which could be treated with more success on expectant lines." The certain conditions he refers to are eclampsia and placenta previa. Rudolph Holmes, of Chicago, says in regard to this, "a surgical operation is not the treatment of eclampsia." He further states, in speaking of the possibility of uterine rupture in subsequent pregnancies, "for that reason alone, the performance of cesarean section for nonpelvic indications should be restricted to the narrowest possible limits." Williams of Baltimore has made similar statements. In view of these opinions, which are based on definite statistical data, it would seem possible that the mortality of mothers in this hospital may be due, in part at least, to what Tottenham speaks of as "surgical zeal."

In the next chart are tabulated the causes of death. There are several things of interest in this list. First, is the high percentage of toxemic cases, doubtless due to hospitalization of such cases. The high relative frequency of the hepatic type is unusual. Twenty per cent of the toxemic cases were of the liver type. Three died of hemorrhage, while in two cases hemorrhage was an accessory cause of death. The causes of the hemorrhage are listed. There were three cases of pneumonia among the mothers which resulted fatally. Embolism, acute hyperthyroidism, shock and acute dilatation of the heart each accounted for two deaths.

With over 3,000 deliveries there was not a death from puerperal septicemia. This condition is indeed commendable. In the state of Washington over 35 per cent of maternal deaths are due to puerperal infection, and similar figures obtain for the country at large.

Tottenham collected statistics at various hospitals during his stay here. They were at great variance and ranged from 0.4 per cent at the Swedish Private Hospital in Minneapolis to 3.6 per cent at the Cook County Hospital in Chicago. A local hospital is credited with a maternal mortality of 0.11 per cent. With such a wide divergence of figures it seems highly probable that there is a lack of conformity in securing and interpreting the data for the several reports.

From this study it appears as though there is cause to be proud of this record, although it is still short of ideal. The absence of any deaths due to septicemia following delivery is praiseworthy. With sepsis conquered, the problems of toxemia and hemorrhage confront us. When we have reduced the fatalities from these two sources to a minimum, we shall have almost reached the ideal in obstetrics from the standpoint of maternal mortality.

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PERSISTENT OCCIPUT POSTERIOR*

ITS TREATMENT BY KIELLAND'S FORCEPS

Torleif Torland, M.D., F.A.C.S.
SEATTLE, WASH.

In discussion of this subject I am confining myself to persistent occiput posterior. All, who with some regularity have followed the obstetric literature, will have noticed it has been recognized more and more by all investigators that occiput posterior occurs early in labor much more frequently than previously supposed, and, furthermore, that the majority of these early posterior positions during the later progress of labor spontaneously rotate anterior, and are delivered as such.

The incident of a primary occiput posterior has been variously reported by different authors as between 10 to 17 per cent of all vertex presentations. Thus Cowles found 17.5 per cent out of 9374 vertex presentations, Williams 11.03 per cent of 5488 and Cragin 11.5 per cent of 2000. My own experience, which is extremely limited compared with these statistics, closely follows the above findings, as in my last 200 cases, where I have kept close watch for this condition, I found slightly more than 12 per cent primary occiput posterior positions.

In the majority of cases, as stated before, there is a spontaneous rotation to anterior position. Therefore, unless we examine very early in labor, the percentage will be much lower. When this spontaneous rotation occurs, the progress and ultimate outcome of labor is no different from any ordinary vertex presentation, except that labor usually is very much more protracted and, therefore, secondary inertia with maternal exhaustion and fetal complications are more common.

Very often an early symptom of occiput posterior is the premature breaking of the water bag. This is, of course, not pathognomonic of this condition, many obstetricians going so far as to say that it is not even a common occurrence. But my own experience has led me always to suspect at least occiput posterior when the water breaks before or early in labor, provided that breech presentation, contracted pelvis or other similar conditions have been excluded.

It is only in a very small percentage of occiput posterior positions that it persists as such. It can approximately be estimated to occur in only 2 to 4 per cent of all posterior positions. And in dealing with these cases we are confronted with one of the most difficult obstetric conditions, a situation where the finest judgment, the nicest diagnosis and the most exacting technical and manual ability are called upon to finish the case successfully.

The particular form of treatment necessary in each case will depend largely on the actual physical findings, the degree of descent of the head, the amount of moulding and fixation, whether the amniotic bag is ruptured, the heart tones and condition of fetus, the duration of labor and the degree of exhaustion of the mother. Taking all these different conditions in consideration, I think there can only be a question of the following forms of treatment, each one having its particular indication and usefulness in each specific case: (1) Forceps delivery of the head in posterior position as such, without any attempt of rotation, (2) internal podalic version, (3) cesarean section. And lastly the methods where rotation is attempted by: (4) Manual rotation, (5) Scanzoni maneuver and finally by (6) the Kielland's forceps.

The treatment, then, resolves itself into two different types, one where rotation is done to the normal anterior position and then extracted, the other where the head is delivered in the posterior position as such, or where some other procedure is attempted.

The old obstetric masters, Baudelocque and later Tarnier, the inventor of the axis traction forceps, considered it impossible to rotate the head and always delivered it in the posterior position, while Smellie, as illustrated by his beautiful copper plates, always attempted a biparietal hold on the head in a posterior position and rotated to anterior before extraction. He used his special short straight forceps with practically no pelvic curve. In high transverse position he put the patient on her side, then pushed the posterior blade in front of the sacrum and the anterior blade back of the pubic arch, and in this manner was able in the majority of instances to get a biparietal hold on the head.

It is taught nowadays, I believe, that a posterior position should not be delivered as such, except where the head has descended very low and is fixed rigidly, or where there is a high degree of moulding or extensive swelling of the soft parts, which would make a rotation impossible. In cases where the head is small and the pelvic outlet large, with an elastic vagina and perineum, this can be performed quite easily. I have done it myself several times. However, in the majority of cases there are extensive maternal lacerations, and often serious damage done to the child.

Podalic version and cesarean section are opera-

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* Read before King County Medical Society, Seattle, Wash., May, 1926.

tions which should only rarely be considered. When done they are usually last resort measures after the patient has been long in labor, and after other types of delivery have been attempted. At this stage the water bag is practically certain to be ruptured, with the uterus well contracted around the fetus, and lower uterine segment so thinned out that version would be a most difficult and dangerous procedure, if possible at all.

If cesarean section was considered more often in this type of case and thought of earlier during the progress of labor and before the patient was completely exhausted, and the dangers of infection increased many times by attempts at forceps delivery, it is possible that much morbidity and many lives, both maternal and fetal, might be saved by this operation. But unfortunately, when done, it is usually so late that the chance of success by any method is very remote. Dr. Lee's popularization of the low cervical section will probably help much towards saving lives in these neglected cases.

We next come to that group of procedures where some form of rotation of the head from occipitoposterior to anterior is indicated, and here we must first mention manual rotation. In my opinion it is not the best method, but it is mentioned first because it seems from numerous reports and textbooks to be the most popular and the one most frequently advocated, often to the exclusion of all other methods. The introduction of the whole hand into the vagina, as often is necessary, must certainly be fraught with considerable more danger of infection than the use of a smooth boiled blade of steel. An obstetrician with a large hand will, furthermore, where the head is low down and impacted in the hollow of sacrum, find it most difficult, if possible at all, to get any hold on the head or shoulder sufficient for rotation. And even when successful, the final results are very often uncertain, as the manually rotated head, frequently before forceps can be applied for traction, spontaneously has rotated back to the posterior position.

In 1900 Brodhead called attention to the advantages in this condition of forceps rotation and delivery by the Scanzoni maneuver. It is in reality a two-stage operation, where forceps first are applied with the pelvic curve towards the occiput, which then is rotated till it stands under the pubic arch or more often in the anterior oblique diameter, with the convexity of the pelvic curve then pointing towards the symphysis pubis. After removal it is again applied in the normal biparietal position, with pelvic curve towards the face of the child, and in hollow of the sacrum, after which extraction is done. This method has many advocates both here and abroad, and with the usual form of forceps with the large pelvic curve it is practically the only way in which it is possible to correct this malposition of the presenting head.

The dangers with this complicated maneuver, where it is necessary several times to introduce the finger or even the whole hand in the vagina, followed by two different forceps applications, are evident to all. Besides the danger of infection there are usually extensive perineal and vaginal lacerations, and frequently irreparable damage done to the fetus. I think these unfortunate results are fairly uniform and usual among most obstetricians the world over. Many successful deliveries have been reported both from private practice and from clinics, but also a great number of disastrous results. The time was, therefore, ripe for some improvement in the instrumentarium, especially for a rotation instrument, and that we have now in Kielland's forceps.

In order better to understand the great importance of Kielland's invention, it might not be out of place to make a few remarks regarding the development of the classical forceps. Previous to Kielland's invention no apparent improvement had been done with the forceps since its first inception and use by the masters of the seventeenth century. This applies especially in its use as a rotation instrument. The only improvement was the Tarnier axis-traction device, a very doubtful improvement at that. Smellie, the greatest master of all in instrumental delivery, used two types of forceps, one with a pelvic curve, and a short straight one without the curve. The last one was used mostly as a rotation instrument in posterior and transverse positions low down. Levret is supposed to have constructed the first forceps with a pelvic curve, but this was not nearly as large as later became usual in the Naegele and Simpson forceps, which are used almost exclusively in America and Europe today.

In Germany in the eighteenth century they were influenced by the French and English school and used almost exclusively Leveret's and Baudeloque's forceps models. There was not much modification until the nineteenth century, except that the pelvic curve gradually became larger and larger, and the forceps thereby entirely lost its quality as a rotation instrument. That this large pelvic curve forceps was also unsuccessful in many other applications is best shown by the numerous different models invented during the last century, none of them of any real value.

When, therefore, Kielland, an obstetrician of Christiana, Norway, first described his forceps modification in 1916, and in connection with it an entirely new method for its application, he was at first met with strong opposition and considerable scepticism. Gradually, however, a large number of favorable reports appeared from all over the world, which all proved and definitely established the fact that we had at last in Kielland's forceps an instrument with great advantages over the older form, and that its usefulness was particularly appreciated in transverse arrest of the head, and as a rotation instrument in medium and low occiput posterior positions.

Kielland's theory, from which he developed his forceps and its special mode of introduction, consisted in always applying the blades biparietally, no matter in what position the head might be. Particularly did he propose to do this in conditions where this was impossible with other types of forceps, in rotation anomalies, as transverse and posterior position of the head; in other words, in conditions where the old classical forceps had proved unsatisfactory.

In a high transverse arrest of the head Kielland's procedure of application is essential, but as this subject is outside the limits of this paper I shall not go further in detail. I may only add that in cases where I have had occasion to use it there have been most satisfactory results.

In an occiput posterior the procedure will be different, depending largely upon the degree of descent of the head, whether this is arrested at the pelvic outlet or higher up. There is very seldom a true occiput posterior in the higher positions. The saggital suture here usually runs in one or the other of the oblique diameters, with the large fontanelle to the right or left under the pubic arch. In these conditions the direct biparietal application of the forceps frequently meets with considerable difficulty, and is often impossible. Here it is advisable to proceed with the forceps application in the particular way recommended by Kielland. The anterior blade is pushed under the symphysis pubis, with the concavity of the cephalic curve away from the head. The forceps is then rotated on its own axis till the cephalic curve fits over the head. The posterior blade is then carried directly in front of the sacrum, back of the head. When the blades are locked, the special build of the forceps, and especially its sliding lock, will in most cases make it possible to obtain a biparietal hold, with the convexity of the pelvic curve towards the face of the fetus, and consequently pointing anteriorly or a little laterally. Rotation and extraction can then usually be done with great ease, provided there is not too great a disproportion between pelvis and head.

In a low position, where the head has descended almost on the perineum, this special application of the anterior blade just mentioned is not necessary. Here a direct introduction of each blade biparietally is possible, but always with the convexity of the pelvic curve towards the child's face, that is, pointing anteriorly. Due to the slender graceful build of the forceps, with the very small pelvic curve, rotation can be done without difficulty, and extraction finished in the majority of cases mostly without any of the tremendous bloody lacerations usual in the Scanzoni method.

Exact diagnosis of position is always necessary, more so with this forceps than with the usual classical type. But this must be considered an advantage rather than the opposite, as then we will be obliged more carefully to watch our cases and make more frequent and painstaking investigations. With some training rectal examinations will give us just as much information as vaginal, especially when coupled with external palpation and auscultation to determine the position of fetal heart.

When we have thus finally mastered the technic in the use of this forceps, and in case after case have experienced the great ease with which delivery can be accomplished, compared with similar cases delivered previously by other methods and by the old forceps, it is then very tempting to try and enlarge its field of usefulness to cases where there are no indications. Particularly am I referring to contracted pelvis, where there is great disproportion between bony structure and presenting head. These are the cases where disappointment is certain to follow, and which might bring this new forceps into discredit. Under such conditions, no matter what kind of instruments are used, they will do nothing but harm and jeopardize lives which might otherwise be saved.

SUMMARY

1. In occiput posterior rotation of the head should always be done whenever possible.

2. This can in most cases be accomplished by the use of Kielland's forceps.

3. They can always be applied in a biparietal manner, no matter what position the head is in.

4. In high posterior positions Kielland's particular mode of introduction of the forceps will usually be necessary. In low posterior arrest the blades can be directly introduced biparietally, and rotation and extraction done.

5. This forceps must be used with the greatest care, and in the hands only of the one who knows its technic, and on definite indications.

6. It is not a "cure all' instrument, and temptation to extend its uses to anomalies not indicated must be resisted. It does not overcome contracted pelvis, except in low degrees.

7. Exact diagnosis of position is here more essential than with other types of forceps.

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1505 Medical and Dental Building.

GWATHMEY'S SYNERGISTIC ANALGESIA IN OBSTETRICS

SALIENT POINTS IN ITS SUCCESSFUL CLINICAL APPPLICATION

Paul E. Spangler, M.D.
PORTLAND, ORE.

Rectal ether has been in occasional use in surgery for a good many years. Early in 1923 Dr. James T. Gwathmey of New York conceived the idea of applying this technic to obstetrics. He (in association with Dr. Asa B. Davis, surgeon-in-chief of New York Lying-In Hospital and its staff) worked out the procedure known as "Gwathmey's Synergistic Analgesia" for the relief of labor pains. It was the privilege of the author, while house surgeon at the New York Lying-In Hospital, to administer and to supervise the administration of this analgesia in nearly four hundred cases and to observe its use in a good many more.

Through the experience obtained there he became convinced that this procedure is one of the most humanitarian developments for the relief of human suffering in recent years. The chief proof of its value and success is the fact that all of the staff of the New York Lying-In Hospital use this analgesia in their private work. Success depends upon careful technic. The failures can be traced directly to errors in technic and the fault lies with the person who administers the medication and not with the method. It is to emphasize these important small points that this paper is undertaken.

The advantages of this method may be summarized as follows. It is not expensive. Compared with nitrous oxide analgesia it is infinitely cheaper, both as to drugs and people necessary for its administration. The synergistic analgesia can be given by the regular obstetric nurse who is on the case. It requires no skilled anesthetist. It is equally applicable to home as to hospital use. It is routine in the home deliveries of the cases handled by the New York Lying-In Hospital. It gives excellent analgesia. No claim is made that this is a painless method of childbirth, but the relief from pain is so great that it is a common experience to have the patient ask sometime after the delivery is over whether the baby has yet been born. The patients who have had the analgesia are enthusiastic about it. It is entirely harmless. No harm has been seen to mother or infant, if the technic has been properly carried out. The induction of complete anesthesia, as is sometimes necessary to bring the head over the perineum and is always necessary for operative delivery, is rendered very easy, as the patient is already in the primary stage of anesthesia.

The objections are few and far outweighed by the advantages. Most of the objections are really the result of a faulty technic. Rarely a slight rectal irritation is seen folowing the rectal medication, but it is so slight as to need no treatment. The patient is not responsible after the analgesia is given and some one must be present to guard against accident or injury. Occasionally patients become very much excited and noisy, but in spite of this their labor continues and their pain is relieved. If the treatment is started too early, labor may be delayed somewhat, but even so no harm can come to the pateint or baby and the patient is not suffering from the pains. Sterile abscesses from the magnesium sulphate injections are sometimes seen and are nearly always due to the fact that the solution was injected subcutaneously rather than intramuscularly.

Occasionally the baby is born somewhat apneic but it can always be revived, if the apnea is due to the drugs used. The difficulty here is usually that anesthesia by inhalation has supplemented the analgesia and has been too generously used. Or perhaps chloroform rather than ether was used. Occasionally this apnea is due to the fact that the morphine has been given too shortly before delivery, so that the infant's respiratory center is at the time of delivery depressed by the full effect of the morphine. The pitfalls can be avoided by adequate knowledge and proper technic.

The apparatus necessary for the administration consists of a 5 c.c. syringe, a 1½ inch needle, a rectal tube with a glass connection, two feet of rubber tubing with a funnel and clamp. Drugs required are morphine sulphate gr. ¼, four to six ampoules (2 c.c.) of 50 per cent magnesium sulphate solution, olive oil oz. 2, and the rectal retention enema which consists of (1) quinine hydrobromide gr. 20, dissolved in oz. 3 of alcohol, (2) ether oz. 2½, (3) olive oil qs. ad oz. 4-6.

A brief recapitulation of the routine as adopted at the New York Lying-In Hospital follows:

1. On admission the patient is given a copious hot soap suds enema. This is followed at once with a copious hot water enema, if labor is advanced, or in an hour or two if labor is just starting. The bowels must be completely cleaned and evacuated, even to the water.

2. When the cervix is at least 2½-3 fingers dilated, the pains are coming at least every five minutes and lasting at least thirty seconds, and the patient is suffering with the pain, give an intramuscular injection (preferably into the gluteus maximus) of morphine gr. ¼ in 2 c.c. of 50 per cent magnesium sulphate solution.

3. Follow this injection in twenty minutes with a second injection of 2 c.c. of 50 per cent magnesium sulphate solution.

4. If labor is so rapid and vigorous that *no* relief of pain follows these two injections in one-half hour, give the retention enema. However, if the patient does get relief from the two injections, withhold the retention enema until labor is again reestablished at its previous rate and vigor, the cervix is at least 3½-4 fingers dilated, and the patient is again complaining of the pain. The enema is followed with a third intramuscular injection of 2 c.c. of 50 per cent solution of magnesium sulphate. The enema is preceded and followed by the instillation of an ounce of olive oil. The enema is given with the patient lying on the left side and with the thighs flexed. She should remain in this position until the tube is removed. Following the instillation of the enema, disconnect the rubber tubing, clamp off the rectal tube, and leaving it in place compress the buttocks. The tube should be left in place for thirty minutes or more.

5. The retention enema may be repeated any time after two and one-half hours have elapsed, if the effects of the first enema are wearing off so that the patient is again suffering pain.

Variations from this routine are sometimes necessary and desirable. If delivery seems imminent, it is probably wise to omit the morphine and at once give the retention enema. The reasons for this are two. First, the ether and oil with quinine by rectum is the most powerful and quickly acting part of the treatment; and, second, it is not desirable to have the maximum morphine effect just as the baby is born. Likewise the magnesium sulphate injections may be omitted, if the time is short, or additional injections may be given, if they seem indicated. Additional ether and oil may be given, if the retention enema is expelled or seems inadequate.

With a hundred pound mother the two and one-half ounces of ether will nearly induce anesthesia, while with a two hundred pound mother this dose may prove entirely inadequate. In such cases it is probably wise to give a larger initial dose of ether and oil. Additional morphine is never given. There is no objection, other than the bulk, to giving more oil in the enema and this mixture often proves less irritating to the rectal mucosa than the proportion given above.

There are several points in the technic which need special emphasis and upon which success or failure with this procedure depends.

1. Intelligent cooperation of the patient is a prerequisite to success. This is secured by explaining to her what it is planned to do and what she may expect. It must be impressed upon her that without her cooperation and minute following of instructions she can expect no relief. Assure her that she will not be allowed to suffer unduly and that she can have relief when she wants it. Most women will not ask for relief until the criteria for starting the treatment have been amply fulfilled.

2. Don't start the treatment too early. This will delay and sometimes stop labor. It is better to have the cervix three and one-half fingers dilated and the pains coming every three minutes and lasting 45-60 seconds, than to start with the minimum requirements as previously set .down. Never start

the treatment if the patient is not suffering with the pains.

3. Be sure your injections are intramuscular. Sterile subcutaneous abscesses are embarrassing. To do this have a needle of adequate length, insert it at right angles to the skin to its full length, and through a skin which is drawn taut. This approximates the skin and fascia. Feel your needle pierce the fascia and slowly withdraw as the injection is made.

4. The retention enema should be given so that it is deposited above the fetal head. Sometimes this is impossible and in these cases a good deal of the enema will be expelled by the advancing head and a portion of the quinine-ether effect will be lost. To aid in introducing the rectal tube above the fetal head a finger in the rectum may direct it properly and keep it from kinking.

5. It is extremely important to leave the rectal tube in place and to keep the buttocks compressed for at least thirty minutes after the enema has been given. Also, if the patient is instructed to breathe rapidly through the mouth during the pains, there will be less tendency to bear down and thus expel the enema. The ether in oil causes at first a slight burning in the rectum and the desire to expel the enema is marked and demands all precaution and cooperation at this point unless failure is to occur.

6. In order to favor the action of the drugs the patient should be in a quiet, dimly lighted room and should be encouraged to go to sleep. She should not be examined for at least an hour after the enema is given, as examinations favor the expulsion of the enema.

7. This is important. If supplementary anesthesia is necessary to bring the head over the perineum or for operative procedure, use only ether and that very sparingly. The patient is already nearly in the first stage of anesthesia and only a few drops of ether are necessary to cause a smooth and quiet transition from this stage of analgesia to obstetric anesthesia. Choloroform is contraindicated because of the danger of the deep gasping inspirations between pains flooding the fetal and maternal systems with an overdose of accumulated chloroform from the mask, which in their already semianesthetized condition might prove lethal to either mother or child.

The author is convinced that those who will use this technic as herein described will become enthusiastic in its praise. It is common for multiparæ who have normal sized babies to require no additional relief at all for the delivery. Primiparæ usually require a few drops of ether by inhalation to bring the head over the perineum. Operative procedures always require supplementary anesthesia, but this is very slight in amount and the transition is smooth and without unpleasantness. However, even if supplementary anesthesia is necessary for the actual delivery, the patient has been relieved of the suffering during labor and the fear of each successive pain is banished. Failure is only due to technical errors and with this procedure added to your obstetric armamentarium suffering during labor is well nigh inexcusable and the procedure is within the reach of all.

922 Corbett Building.

UTERINE HEMORRHAGES*

Henry Schmitz, A.M., M.D., F.A.C.S.
CHICAGO, ILL.

From the Department of Gynecology of the Loyola University School of Medicine, Mercy and Cook County Hospitals

The clinical interpretation of abnormal hemorrhage from the female genitalia is of the utmost importance in determining the etiology, making a diagnosis and instituting rational treatment. No other subject in gynecologic symptomatology possesses greater clinical value. A study of the character of genital bleeding in 1263 cases admitted during the year 1924 has been made to determine the clinical character and causes of uterine hemorrhages. The information thus obtained forms the basis of this report.

The questions considered most important in this investigation were:

1. What are the clinical characteristics of menstruation?

2. What constitutes a complete interrogation of the patient to obtain an exact history of normal and abnormal bleedings?

3. How may uterine hemorrhages be grouped on an etiologic basis in order to facilitate diagnosis and treatment?

4. What are the methods for treatment?

Uterine hemorrhages have been divided into (1) those dependent upon recent pregnancy, and (2) those independent of recent pregnancy.[1] Since the gynecologic department is sharply separated from the obstetric department, it is only rarely that hemorrhages due to accidents of pregnancy, labor and

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*Read before the Forty-eighth Annual Meeting of Medical Association of Montana, Billings, Mont., July 16-17, 1926.

TABLE 1.
PUBERTY.

Year of Onset	Up to 10	10	11	12	13	14	15	16	17	18	19	20 and after	Total
No. of Cases Cases	1	6	35	141	208	235	120	80	44	16	5	3	894
Per cent	0.1	0.7	4.0	16.0	23.0	26.0	13.5	9.0	5.0	1.8	0.6	0.3	100%

TABLE 2.
MENOPAUSE

Year of Onset	Before 35	35–39	40–44	45–49	50–54	55 and after	Total
No. of Cases	4	15	25	45	32	4	125
Per cent	3.2	12.0	20.0	36.0	25.6	3.2	100%

TABLE 3.
PERIODICITY

Interval up to	20 days	21	22	23	24	25	26	27	28	29	30	31–34	35 and more	Total
No. of Cases	29	20	2	3	2	2	8	8	741	1	39	11	30	896
Per cent	3.3	2.2	0.2	0.3	0.2	0.2	0.9	0.9	82.7	0.1	4.4	1.2	3.4	100%

TABLE 4.
DURATION OF MENSES

Days	1; 1–2; 1–3.	2; 2–3; 2–4.	3; 3–4; 3–5.	4	5	6	7	8	More than 8	Total
No. of Cases	11	37	256	242	154	47	61	19	14	841
Per cent	1.3	4.4	30.4	28.7	18.3	5.6	7.3	2.3	1.7	100%

TABLE 5.
AMOUNT OF FLOW

Scanty	Cases: 59	Per cent	6.0
Moderate	627		64.0
Profuse	283		30.0

puerperium are seen. They do, however, constitute a large number of cases of genital hemorrhage. Therefore is is imperative that the possibility of pregnancy must always be borne in mind. Otherwise unfortunate mistakes of diagnosis and treatment would be numerous. If a woman during the childbearing period of life complains of amenorrhea or a genital hemorrhage taking place after a period of amenorrhea, she should be deemed pregnant, unless proven not to be pregnant. If in doubt, a waiting attitude and observation will help in the diagnosis, as the pregnant uterus increases in size at a more rapid rate than a tumor.

A small number of uterine hemorrhages are caused by general conditions, especially internal disease, such as the acute infectious diseases (i.e., influenza, typhoid fever, scarlet fever, variola, rheumatic fever and malaria), hemophilia, uncompensated cardiac lesions, hepatic disease, pulmonary emphysema, chronic nephritis and so forth. Such uterine hemorrhages are seen by us only in a consulting capacity and, therefore, are not considered in this report. Heyn[2] reported 285 cases of menorrhagia and found 11.58 per cent resulted from passive congestion due to general diseases.

THE CLINICAL CHARACTERISTICS OF MENSTRUATION

The year of onset of menstruation, or puberty, was obtained from 894 histories. Table 1 shows the number and percentage for each year. In 65 per cent of the cases puberty appeared during the 12th, 13th and 14th years, and in 96.5 per cent between 11 and 17 years inclusive. We may, therefore, say that, if a girl has not begun to menstruate at the end of the 17th year, a searching examination of the patient must be made to determine the cause of delayed puberty.

The termination of menstrual life, or *menopause,* is tabulated in Table 2. It is seen that 61.6 per cent reached the menopause between 45 and 54 years inclusive, 35.2 per cent before 45 years, and 3.2 per cent after 54 years. Forty-six, or 36.1 per cent, reached the menopause between the ages of 48 to 51 inclusive. Dietz[3] found in 1480 cases that

TABLE 6.

A. Menses Too Profuse and Too Long

Total No. 157 Cases, or 41.03%

	Decreased Contractility of Uterus			Hypermia	
	Hypoplasia uteri	Asthenia uteri	Myomata uteri	Active Pelvic Diseases	Passive Internal Diseases
No. of Cases	15	21	45	76	0
Per cent	9.6	13.4	28.6	48.4	0

B. Menses Too Frequent

Total No. 59 Cases, or 17.94 Per Cent

	Primary Ovarian Hypofunction		Secondary Ovarian Hypotunction	
	Infantile	Menopausal	Infl. Pelvic Diseases	Int. Diseases
No. of Cases	8	14	36	1
Per cent	13.56	23.73	60.11	2.10

C. Metrorrhagia

Total No. 152 Cases, or 41.03 Per Cent

	Chron. Hyperplasia of Endometrium with Persistent Ovarian Follicle	Carcinomata and Sarcomata	Accidents of Pregnancy, Labor and Puerperium	Cervicitis Senilis	Lues
No. of Cases	15	113	12	5	7
Per cent	9.87	74.35	7.89	3.29	4.60

the menopause appeared before 45 years in 14 per cent. He names as causative factors starvation, many labors rapidly succeeding each other, and profuse genital hemorrhages. In how far such causes play a rôle in the 35.2 per cent of cases in our series, in which the menopause appeared before 45 years of age, will be the subject of a future study.

The *periodicity*, or the interval from the first day of menstruation to the first day of the next menstruation, has been recorded in Table 3. In a total of 896 cases the menses occurred too soon, that is, at intervals of twenty-three days or less, in 54 cases or 6+ per cent. If the menstrual flow in these patients had previously been of the normal twenty-eight day periodicity, the 54 cases would constitute a true menorrhagia or polymenorrhea since the menses are appearing too soon.

The *duration* of the menstrual flow is of clinical interest. In Table 4 it is seen that in 77.4 per cent of the cases the duration of flow was three to five days. The highest percentage consists of cases of three days' duration. If the flow lasts too long an abnormally prolonged menstruation or menorrhagia is present. A menstruation that lasts longer than five days is a prolonged menstruation. A menstruation lasts longer than three to five days, if the contractility of the uterus is diminished or the blood supply to the pelvis is increased by active and passive hyperemia. However, a duration of more than seven days has been taken as a too prolonged menstrual flow or hypermenorrhea. Therefore, we may state that in 94 patients, or 11.3 per cent, the flow lasted too long, that is, menorrhagia was present.

The *amount* of the flow can be determined only relatively. Interrogation of patients elicits contradictory answers. However, the staining and saturation of the vulvar pads worn during the menses give a relative measure. A patient knows whether the pad is stained a pale red, watery color, or a dark but transparent red, or is saturated with blood, admixed with coagula and strings of fibrin. The first described staining was recorded as a scanty flow; the second as a moderate or average flow; and the last was a profuse flow. In our series of cases the amount was scanty in 59 cases, or 6 per cent; moderate in 627 cases, or 64 per cent; and profuse in 283 cases, or 30 per cent. The patients in this last group suffered from menorrhagia or hypermenorrhea as the flow was too profuse.

In passing it may be stated that 132, or 12.11 per cent of 1090 cases, complained of dysmenorrhea.

The study of the character of the menstrual flow revealed, therefore, that menstruation occurred too soon in 6 per cent, lasted too long in 11.3 per cent, and was too profuse in 30 per cent of the cases. Most of the patients complained of the flow being profuse and prolonged. The too frequent occurrence of the flow, or polymenorrhea, was in quite a number combined with a profuse and prolonged menstrual flow or hypermenorrhea. In a total number of 1090 cases, which were free of any objection for this study, abnormal bleeding occurred in 368 cases or 33.67 per cent.

The average menstrual life is characterized by puberty taking place sometime from the 11th to the 17th year inclusive; in the greatest number, that is, 26 per cent, it occurs during the 14th year. The menopause appears from the 48th to the 51st years inclusive. The periodicity in 82.7 per cent of the cases is 28 days. The duration in 77.4 per cent is from three to five days and in 30.4 per cent it is three days. This may be expressed in a simple formula thus: 14:28:3-5:48, in which 14 is the year of puberty, 28 the periodicity, 3-5 the duration, and 48 the year of the menopause.

THE INTERROGATION OF THE PATIENT

In order to determine the nature of the genital hemorrhage it is imperative that an exact history be taken and that minute general and gynecologic examinations be made. The history will aid in the interpretation of the probable cause in the majority of the cases. The following outline is given to recall to our minds the questions which must be answered by the patient.

1. *Interrogation in reference to the Menses.* Determine the regular type of menstruation, considering puberty, periodicity, duration, amount and character of flow, dysmenorrhea, pre- and postmenstrual discharges and their character, and the age when the menopause took place.

The questions relating to dysmenorrhea are: the time of appearance of the pain in relation to the flow, whether preceding, accompanying or following; the duration; the location; the character, as sharp or dull, continuous or interrupted, bearing down-like, laborpain-like or cramp-like; and the degree of severity. A dysmenorrhea is present if the patient is compelled to interrupt her daily work or seek medical relief.

The characteristics of the discharge are: the time of appearance in relation to the menses, whether preceding or following; the duration; the character, whether watery, creamy, stringy or white, yellowish, brownish, reddish; the amount, whether it stains the underwear or causes burning and itching of the vulva; and the odor, whether odorless or putrid.

2. *Interrogation in relation to Hemorrhages.* Does the hemorrhage occur at regular intervals as every 15, 18, 21, 28 or more days, or is it continuous with or without interruptions? State the time of onset of the hemorrhage. Did the hemorrhage begin suddenly after a normal menstruation or did an amenorrhea precede the hemorrhage? Did a cause such as pregnancy, labor, puerperium, pelvic disease or general disease exist or was there trauma from intercourse, douching or gynecologic examinations? Did the hemorrhage, whether too long, too profuse, or too frequent, increase gradually in severity, for instance from month to month, or did it immediately appear as a profuse bleeding?

If the hemorrhages occur *periodically*, then state the amount and duration of the bleeding and the interval between bleedings. If the hemorrhages occur at *irregular*, atypical intervals, then state whether a regular menstrual flow still exists, and if so, whether the abnormal bleeding precedes or follows the menses or occurs in the interval. If the hemorrhage is *continuous*, determine how long it has existed. Did it start with a normal menstruation which did not stop, or did it appear after the regular menstrual flow had already ceased? What was the time duration between the last menstrual flow and the appearance of the hemorrhage? What are the characteristics of the abnormal bleeding, such as amount, duration, arterial or venous blood, coagulation, odor and so forth?

It is advisable to draw a hemorrhage chart, such as advised by Kaltenbach[4] and improved by R. Schroeder,[5] depicting the characteristics of the genital bleeding obtained from the interrogation. The diagram should begin with the last months of normal menstruation and continue to the day of admission to the office or hospital. The following illustrations will give an idea: A rubber stamp may be made from the pattern which can be quickly impressed upon the history chart (fig. 1). Two such stampings constitute a period of fourteen lunar or menstrual months each of twenty-eight days and therefore comprise a few days more than a calendar year. Figure 2 depicts the charting of a perfectly normal menstruation. Figures 3 to 12 show every possible departure from the normal menstruation and every possible form of hemorrhage. Reference to these figures will be made in subsequent paragraphs.

The premenstrual bleeding recorded in figure 3 signifies an exaggerated state of the premenstrual hyperemia and discharge. The blood escapes by

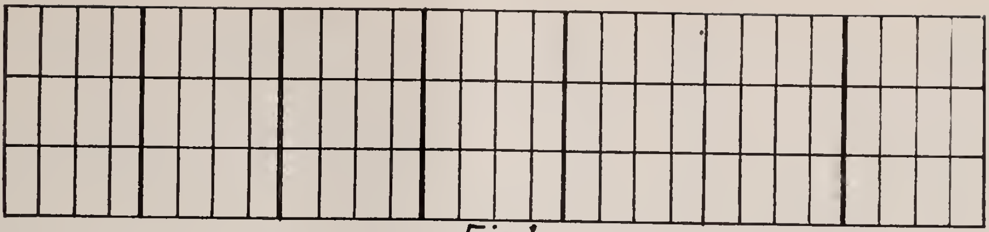

Fig 1

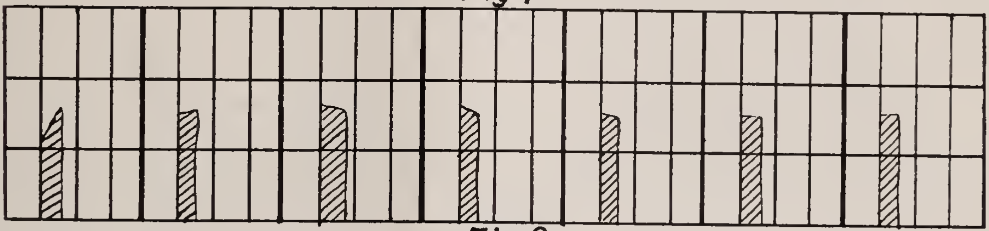

Fig. 2

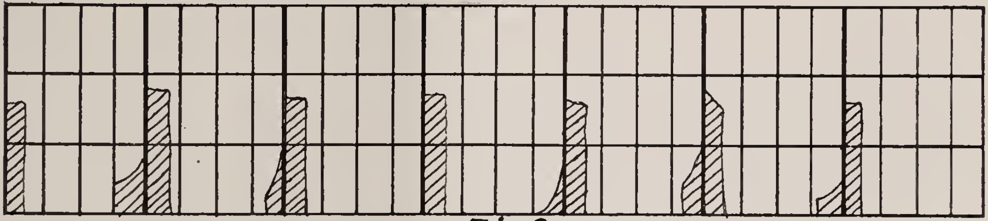

Fig 3

Fig. 1. Pattern for hemorrhage charts.
Fig. 2. Normal menstruation.
Fig. 3. Premenstrual bleeding.

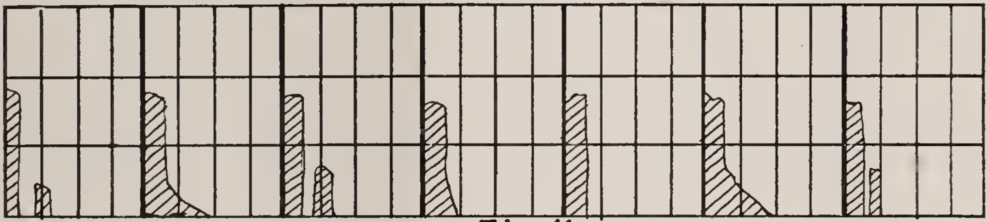

Fig 4

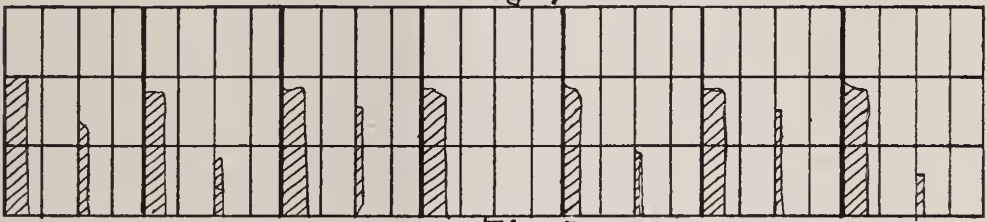

Fig. 5

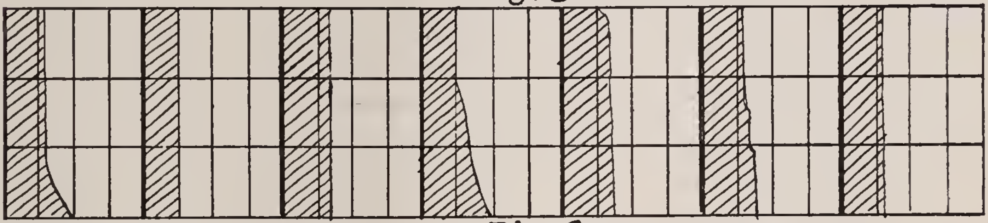

Fig. 6

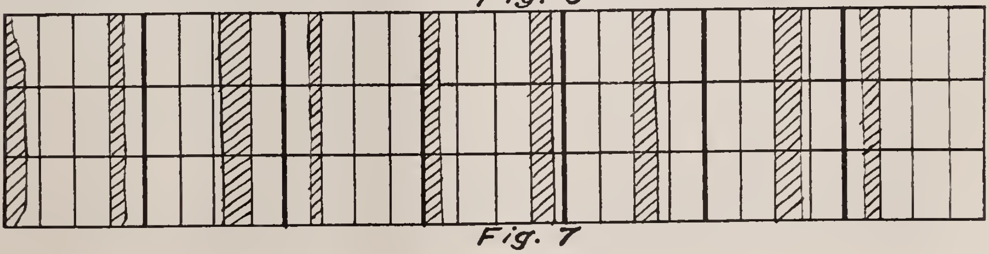

Fig. 7

Fig. 4. Postmenstrual bleeding.
Fig. 5. Interval bleeding.
Fig. 6. Prolonged and profuse menses.
Fig. 7. Profuse and too frequent menses.

diapedesis. The condition is devoid of any clinical significance, if no other pathologic changes, such as chronic cervicitis with erosions, pedunculated mucous polypi, descent of parts and so forth can be demonstrated in the genitalia.

After a normal menstrual flow a scanty bleeding may persist for a few days or reappear after a few days. If a curettement should be done at this time, the microscope will show the normal phase in the endometrium found at this stage of the monthly cycle. Atonicity of the uterine muscle, small myomata, submucous polypi, lacerations and erosions of the cervix, and active or passive congestion are the most frequent causes. The bleeding is by diapedesis. Carcinomata, polypi and ulcerations must be excluded by diagnostic curettage. Profuse postmenstrual leucorrheas are caused by the same factors.

A perfectly healthy and normal woman may have in the middle of the interval between the menses, corresponding with the time of dehiscence of the ovum from the Graafian follicle, pain in the pelvis and sacrum, a perceptible discharge and even scanty bleeding (see fig. 5). R. Schroeder[5] has examined twenty such cases. Five had normal findings on palpation; twelve had cervicitis and erosions; two had vaginitis; and one had a prolapse of the anterior vaginal wall. Curettement of the endometrium showed the histologic findings typical of the phase of the menstrual cycle at this time.

Treatment in these three unusual conditions is indicated, then, only when pathology is present in the genital tract. Otherwise treatment is unnecessary and useless. These three conditions do not belong to the uterine hemorrhages. The latter are characterized by profuse or prolonged or frequent losses of blood. The uterine hemorrhages are distinguished by either *periodical* bleedings that last too long, are too profuse, or occur too soon. That is, the periodicity of menstruation is shortened from the previously existing twenty-eight days to twenty-four days or less, or by *continuous* bleedings of a more or less profuse character.

THE CLASSIFICATION AND CAUSATION OF UTERINE HEMORRHAGE

Menstrual hemorrhages are termed menorrhagias; intermenstrual hemorrhages metrorrhagias. The former result from functional derangements of the uterus or ovaries. Metrorrhagias are caused by pathologic changes in the genital tract. They appear at irregular intervals and are independent of the menses.

Menorrhagia implies that the menstrual flow is either too profuse, lasts too long, or occurs too soon. The amount and duration of the flow depend solely upon the functional state of the uterus and active pelvic or passive general hyperemia. The factors controlling the amount and duration of the menses are the contractility and tonicity of the uterus and pelvic hyperemia. Loss of contractility and tonicity is associated with the infantile, hypoplastic uterus; asthenia, general or uterine; and myoma. Hyperemia may be either active or passive. Active hyperemia results from genital infections and displacements, and passive hyperemia from cardiac, pulmonic, hepatic or nephritic disease (see fig. 6).

The periodicity of the menses depends upon the time of ovulation and the life duration of the expelled ovum. If the life of the ovum is shortened, then resolution of its corpus luteum ensues and menstruation is started. It would consume much time to discuss the influence of the dehiscent ovum on the corpus luteum and the secretion of the latter on the endometrium. Likewise, the phases of the changes in the endometrium cannot be considered at this place. However, all these factors exercise a great influence on the character of menstruation. The reader is referred to the monographs of Fraenkel,[6] Hitschman and Adler,[7] R. Schroeder,[8] E. Novak,[9] R. Meyer,[10] Meyer-Rüegg,[11] J. G. Clark,[12] Aymerich[13] and so forth.

If ovulation occurs too soon, or if the expelled ovum possesses a low vitality and is short-lived, then the menstrual flow will also come on too early. Disturbances of ovarian function may be primary or secondary. The primary dysfunctions are caused by a congenital hypoplastic state which also involves the ovaries. Ovarian function suffices to bring about maturing of Graafian follicles, but the product of ovulation, that is the expelled ovum, has lessened viability. Such menorrhagias usually occur at the beginning of menstrual life, and for the same reasons at its termination, when ovarian function begins to ebb. The former are termed juvenile or pubescent menorrhagias, the later menopausal or preclimacteric. About 25 per cent are juvenile and about 75 per cent menopausal (see figs. 7 and 8).

Secondary ovarian hypofunction is caused by infections which invade the ovary and corpus luteum and general diseases which interfere with the function of the ovary.

Metrorrhagias are caused by chronic hyperplasia of the endometrium, carcinomata, sarcomata, chorionepitheliomata, cervicitis, senilis, lues and so forth.

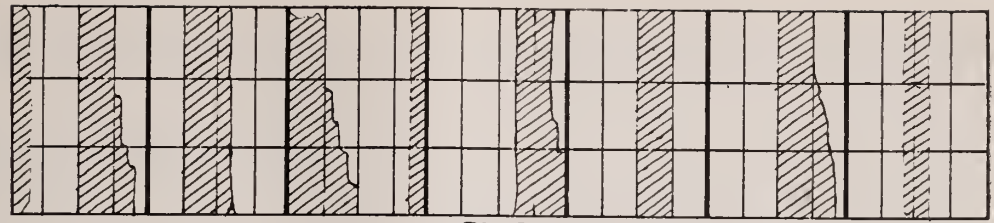

Fig 8

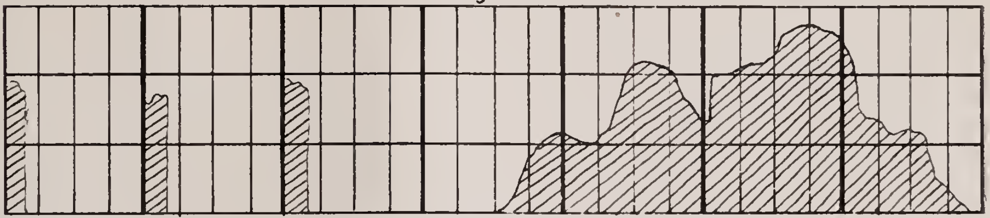

Fig 9

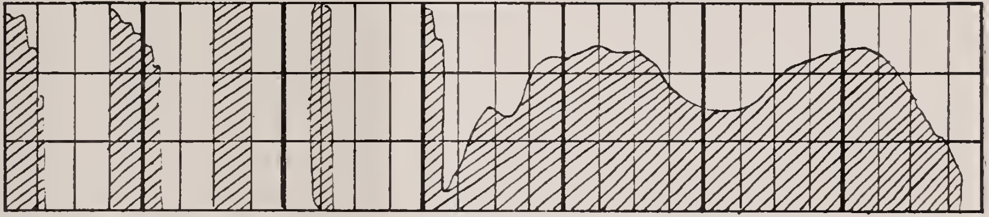

Fig 10

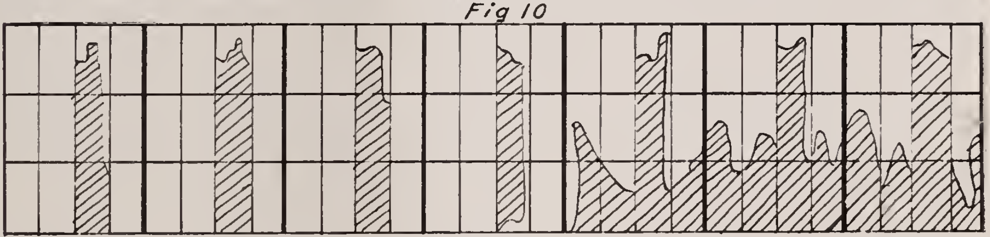

Fig. 11

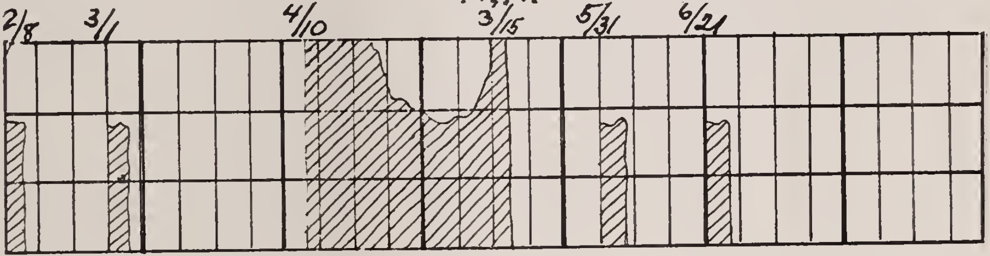

Fig 12

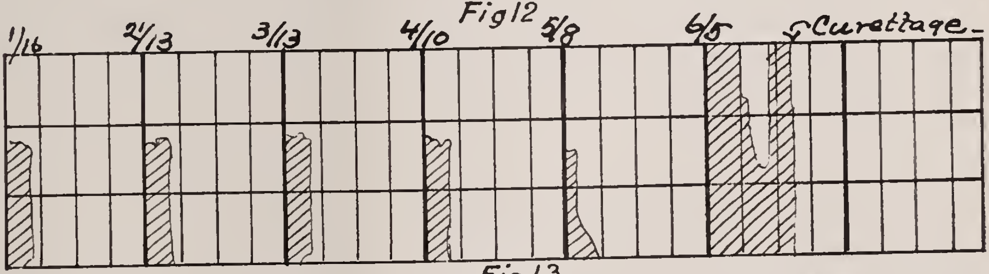

Fig 13

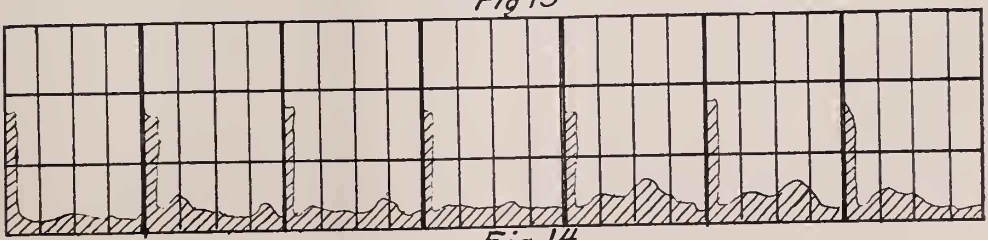

Fig 14

Fig. 8. Menses too profuse, too long and too frequent.
Fig. 9. Hemorrhagic metropathy.
Fig. 10. Menorrhagia and later hemorrhagic metropathy.
Fig. 11. Menorrhagia. Later metrorrhagia. V-Para. Age 46. Carcinoma cervicis uteri.
Fig. 12. Mrs. L. IV-Para. One full term, three abortions. Age 38. Menses 11-21-5 type. Diagnosis, induced abortion.
Fig. 13. Mrs. A. Age 30. Menses 14-28-5. Diagnosis, abortion. Curettage. Micr. rep., abortion, curettage.

Fig. 14. Mrs. K. Age 30. Menses 14-28-45. Diagnosis, cervicitis with erosions and lacerations. Four years ago menorrhagia for 5 days and 5 weeks postpartum. Two years ago menorrhagia for 4 weeks. For last 18 months scanty acyclic bleeding, continuous for last year. Always more profuse after coitus, lifting and expulsion of hard stools. No loss of weight or strength.

The following table 6 gives the number and percentages in each class and for each diseased condition. In 1090 cases uterine hemorrhages occurred in 368 cases or 33.67 per cent (see figs. 9, 10 and 11).

THE TREATMENT OF UTERINE HEMORRHAGES

A patient suffering from uterine hemorhrages should not be treated unless the underlying cause has been determined and a correct diagnosis made. All bleeding that does not occur synchronously with the physiologic menses must be viewed with grave suspicion until it has been proven to be benign. If the introduction of the uterine sound into the uterine cavity with strictest aseptic precautions causes a thin stream of bright red blood to escape into the vagina, then this observation may be regarded as highly suspicious of malignancy, especially if the trickling of blood continues for some time after the manipulation. Such a case should at once be subjected to curettage and a microscopic examination be made to ascertain the exact pathologic condition. If the flow does not occur, the evidence is strongly against malignancy. This sign is only a contributory means of arriving at a diagnosis and should not be regarded as conclusive. Carcinoma is a corrosive process and explains the observation (Clark, J. G.[12]).

Every woman beyond the menopause who has bleeding should be examined, and if the cause does not become evident, the uterus should be curetted and the scrapings examined microscopically (Cullen, T. S.[1]). This may be put into a still safer form: Every woman suffering from uterine hemorrhages should be examined and, if the cause does not become evident, the uterus should be curetted and the scrapings examined microscopically. Such a curettage has not only a diagnostic import, but also a curative one, as about 50 per cent of uterine hemorrhages are thereby arrested. Of course malignant new-growths are excluded from this percentage.

All postmenopausal bleedings must be looked upon with suspicion. They should be regarded as due to carcinoma, unless proven to be benign by the microscopic examination of scrapings or excision of suspicious looking tissue. Therefore, diagnositc curettage is imperative.

Postclimacteric bleeding without a lesion of the uterus is an important early sign of ovarian tumor.[14] The tumors are often of the granulosa cell variety and the uterine changes suggest ovarian hormonal influence. Such ovarian tumors are frequently carcinomatous. It would seem a mistake, therefore, to postpone operation until the appearance of a palpable tumor.

Sounding and curetting are contraindicated when (1) the slightest suspicion of pregnancy exists (such a case has a history of a preceding amenorrhea); and (2) acute and subacute infections have invaded either the vulva, vagina, cervix, uterus, uterine tubes or the pelvic peritoneum.

Another supposition must be recalled to our minds, namely, whether the hemorrhage is of such gravity as to require treatment and whether it is imperative to check the hemorrhage on account of its profuseness either in amount, duration or frequency.

The profuse and prolonged menses, that is, hypermenorrheas, indicate such therapeutic measures that will cause a reactivation of the contractile powers of the uterus or an ablation of the pelvic hyperemia.

The too frequent menses or polymenorrheas demand a correction of the ovarian hypofunction, that is, a regulation of the process of ovulation and the production of fully viable ova.

The aperiodic and continued hemorrhages, that is, the metrorrhagias, require a removal of the underlying pathology in the uterus and ovaries.

Hence the treatment may be discussed in three subgroups:

1. The menorrhagias with too prolonged and too profuse menses, that is, hypermenorrheas.
2. The menorrhagias with too frequent menses, that is, polymenorrheas; and
3. The metrorrhagias with either acyclic or continuous hemorrhages.

1. THE MENORRHAGIAS WITH HYPERMENORRHEA

The underlying cause must first be removed. The contractility of the uterus should be stimulated or the active and passive hyperemia reduced.

Infection and displacement of the uterus, vagina and adnexa, chronic cervicitis with laceration, erosions and infection are treated in the usual manner. The bowels should be regulated preferably by dietary and not medical measures. Tea, coffee and alcohol should be interdicted. During the menses the patient should rest in the reclining position. Between the menses the body should be built up by well-regulated gymnastic exercises, out-of-door life, swimming, bicycling, walking, tennis and so forth. Such measures will relieve the hyperemia due to local pelvic conditions.

The contractility of the uterus may be increased by ergot, hydrastis, adrenalin, the extract of the posterior lobe of the pituitary gland or extract of the parathyroids.

Adrenalin solution 1-1000 may be injected intramuscularly in 0.75 c.c. doses twice weekly. Pituitary extract may be used in 0.015 gm. in solution intramuscularly twice weekly for twelve doses. Twenty-five units of parathyroid extract standardized according to Collip's method are given at the beginning of menstruation and the same dose is repeated twelve hours later.

In menorrhagias of the hypermenorrheal type that are due to loss of tonicity or contractility of the uterus, not complicated by hyperemia, and seen in the hypoplastic and asthenic uterus may be stimulated to normal growth by the use of the ovarian follicular hormone, standardized in rat units according to Allen and Doisy.[15] Recently Pratt and Allen[16] have reported clinical observations and state that injections of ovarian follicular hormone into primates, monkeys and human beings, from which ovaries have been removed, produce growth in the uterus.

Physiotherapeutic measures such as the positive galvanic and faradic currents and diathermy are useful. They should be applied from the back to the anterior abdominal wall. Ultraviolet air-cooled light is especially useful in asthenia. Hypermenorrhea may be changed to a normal menstrual flow if diathermy is used daily, beginning on the first day of the menses.

The treatment to arrest the very profuse menorrhagia at the time of its occurrence consists in rest, hot vaginal douches, vaginal packing, cold compresses to the abdomen, ergot, adrenalin, serum and so forth.

2. THE MENORRHAGIA WITH POLYMENORRHEA

Polymenorrhea, i.e., menses occurring to soon, may exist as such, or be combined with hypermenorrhea, that is, too profuse and too prolonged menses. In the primary ovarian hypofunction the treatment should tend to regulate ovarian function and promote the viability of the expelled ovum. In secondary ovarian hypofunction the underlying causative pathology must be removed and then the ovarian function regulated as in the primary form.

The general hygienic measures are the same as given in the previous paragraph. If hyperemia is absent, baths, hot vaginal douches, applications of heat and diathermy are useful.

Ovarian function may be increased by the use of thyroid, pituitary and ovarian follicular hormone extracts.

Intrauterine applications of 20 per cent alcoholic solution of phenol or 10 per cent alcoholic solution of ferric chlorid may by irritation cause stimulation of ovarian function. Curettage is also a stimulating measure, as it promotes contractility of the uterus and thereby stimulation of ovarian function.

More radical measures in both kinds of menorrhagia are curettage and finally radium and x-rays, if all other measures have failed and age does not contraindicate the use of the rays. The use of surgical and radiologic treatment is a tacit admission that the preferable methods of conservative treatment have failed. Curettage, fortunately, will stop about 50 per cent of such bleedings. In young women it may be repeated, if the hemorrhages recur. Radiations are competitors of surgical castration. The introduction of radium and x-rays in gynecologic therapy has supplanted corpus amputations and resections for benign uterine hemorrhages.

3. THE TREATMENT OF METRORRHAGIAS

The underlying disease indicates the remedial procedure necessary for the arrest of the bleeding.

There is one condition which demands detailed discussion, namely, the persistent ovarian follicle and the resulting hyperplasia of the endometrium. This is the "metropathia hemorrhagica" of Continental writers, often also called "hemorrhagic myopathy" by American writers. Though changes in the myometrium may occur, still the pathologic changes are usually confined to the endometrium. The designation "hemorrhagic metropathy," therefore, signifies a persistent ovarian follicle with a chronic hyperplastic endometritis. R. Schroeder,[8] Cullen[19] and Novak[9] have described this disease and given it a proper entity. The persistent ovarian follicle is the primary lesion, the hyperplasia of the endometrium the secondary lesion. The endometrium is subordinate to the influence of the ovary.

HEMORRHAGIC METROPATHY

The maturing follicle does not rupture, the ovum is not expelled, the follicle continues to grow and persist. The cystic follicle contains clear fluid. The walls are formed of a succulent, thick granulosa layer which rests upon a fibrous membrane and a theca interna, richly supplied with capillaries.

The uterus has a soft, loose, juicy and bluish colored myometrium. The cervix is soft and wide. The endometrium is thickened. It represents a persistence of the premenstrual proliferative phase of the menstrual cycle. The surface may be smooth and even or irregular, fuzzy, fungoid or polypoid. On microscopic examination an increase of the epithelial and stromal elements is found. The glands are enlarged, many are cystic. The disparity in the

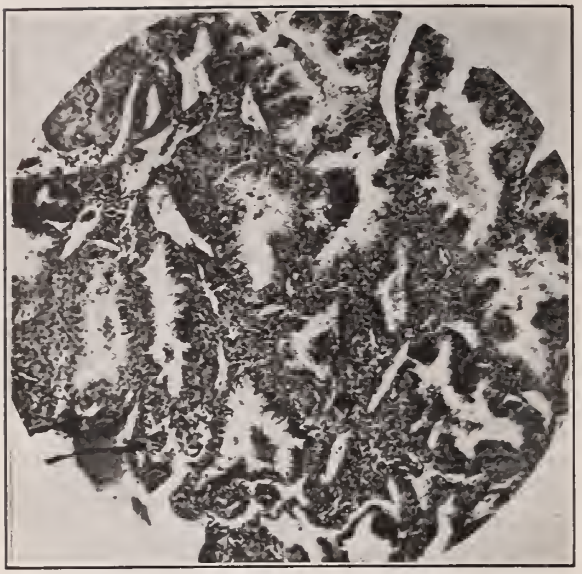

Fig. 15. Chronic hyperplasia of the endometrium due to a persistent ovarian follicle.

glands is the most conspicuous feature. The epithelial cells are seen to be several layers thick. The stroma is markedly increased. Occasionally mitoses are noted. Necrotic degenerations of the hyperplastic mucosa are the real sources of the alarming hemorrhages seen in this disease (see fig. 15).

About 75 per cent of endometrial hyperplasia due to a perisistent ovarian follicle occur from forty-one to fifty years of age; about 25 per cent at the beginning of menstrual life, though it may occur at any age. Irregular and continued hemorrhages are the outspoken symptom. An amenorrhea of five to eight weeks, rarely longer, precedes the onset of the hemorrhage (see figs. 9 and 10). On bimanual examination the uterus is large and soft in the climacteric metropathies, and the uterus may be hypoplastic but soft in the juvenile or pubescent metropathies; the ovary in both forms is cystic and the size of a hen's egg.

The pubescent metropathy should be differentiated from a possible abortion and extrauterine pregnancy, the preclimacteric metropathy from a possible abortion and particularly malignant disease. Therefore, diagnostic curettage and microscopic examination of the scrapings are imperative.

The course is transient, especially if the Graafian follicle ruptures or should be ruptured. Ovulation, follicle ripening and corpus luteum formation may then again proceed normally. The endometrium undergoes resolution to normal.

The treatment of the juvenile or pubescent hemorrhages is difficult, as the cause lies in the function of the ovary and the organization of the ovum. There is a primary ovarian insufficiency plus an insufficient development of the uterus, especially the myometrium.

The mode of living, labor and rest, good wholesome, nourishing food, and exercise must be regulated. Measures which produce hyperemia, as diathermy and hot baths, should be prescribed. Adrenalin, parathyroid and pituitary extracts should be given as mentioned before. Finally the hemorrhage may be arrested by curettage, which may be repeated a second and third time. The persistent ovarian follicle may be ruptured bimanually under narcosis. In hemorrhagic diathesis the x-rays may be applied to the spleen. The dose is 15 per cent of an erythema skin dose effective in the organ. If this treatment should fail, the spleen may have to be extirpated. If all treatment fails, the persistent corpus luteum should be resected.

The following restatement is made: The hemorrhages may be cyclic and acyclic. The *cyclic bleedings* or hemorrhagias are caused by irregularities in the maturing of ova or early death of the dehiscent ovum and the infantile muscle weakness, which may be local in the uterus or general. The *acyclic hemorrhages* or metrorrhagias are caused by atypical ripening of the follicle which remains persistent. The latter are the hemorrhagic metropathies. Such a division is absolutely necessary to the application of the proper treatment in juvenile hemorrhages.

The treatment of preclimacteric metropathies consists in a curettage which is curative in about 50 per cent of the cases. The scrapings must be examined histologically to exclude cancer. Recurrence of the bleeding indicates the use of x-rays or radium. The latter is the routine treatment in most of our gynecologic clinics. Radiation therapy has supplanted abdominal and vaginal corpus amputations.

SUMMARY

1. A classification of uterine hemorrhages based on the etiologic factors has been described.

2. A method of obtaining the complete history with special reference to menstruation and uterine hemorrhages has been given.

3. The clinical characteristics of menstruation and uterine hemorrhages observed in about 1200 gynecologic patients have been given in percentages and illustrated by hemorrhage charts.

4. The uterine hemorrhages have been grouped into (a) menorrhagias, and (b) metrorrhagias. The menorrhagias have been again divided into hypermenorrheas, if the menses are too profuse or last

too long, and polymenorrheas, if the menses occur too soon.

5. The treatment of hypermenorrhea, polymenorrhea and metrrohagias has been given.

6. Hemorrhagic metropathy has been discussed. It is divided into the juvenile or pubescent and the climacteric or menopausal hemorrhagic metropathies. The etiology, pathology, symptomatology and therapy have been given. Hemorrhagic metropathy, or endometrial hyperplasia due to a persistent ovarian follicle, is the most important form of the metrorrhagias, if malignant diseases are excluded.

7. It is imperative that curettage be performed and the scrapings examined microscopically, if the cause of the bleeding cannot be determined. Otherwise hidden malignant disease may be overlooked.

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ECTOPIC PREGNANCY

A CASE DIAGNOSED AS ACUTE SALPINGITIS

Goodrich C. Schauffler, M.D.

PORTLAND, ORE.

D. S., a single white girl aged 20, a factory worker, entered hospital for relief of abdominal pain. The patient had been thin and pale for many years, but had suffered only minor ailments. She lived with her family and stated that she had never had intercourse, nor any venereal disease or the symptoms thereof. Her menstrual history was not remarkable.

Four weeks before admission she menstruated normally. The following week she noticed a dull gnawing pain in the left lower quadrant, with associated slight tenderness. She was able to continue at work however, for two weeks, or until six days before admission, though the pain persisted. She came to the hospital because of a severe epigastric pain, beginning at this time and lasting for a day, gradually shifting again to the lower left quadrant. This pain was so severe that she went to bed, where she stayed until coming to the hospital. There were no other symptoms or signs. At admission she said she had just started to menstruate.

Physical Examination. The patient was a thin, anemic appearing young woman of about 20, obviously quite sick, but not in shock. She showed a grayish pallor, coated tongue and rather foul breath. During the six days before operation, her pulse varied from 100 to 126; temperature, from 99° to 100.5° F. (for the most part under 100°); and respirations 20 to 24.

The abdomen showed moderate generalized tenderness, with marked tenderness in the left lower quadrant, and spasm sufficient to prevent the outlining of a possible mass abdominally. No rigidity, distention, etc.

Vaginal examination revealed a nulliparous introitus, ruptured hymen, but no stigmata of chronic gonorrheal infection. Cervical and uretheral smears, however, showed many gonococci. There was a slight cervical discharge of dark blood, presumably menstrual. There was a small movable, moderately tender mass felt in the right vault, in the region of the tube. The uterus could not be satisfactorily outlined. The left vault was bulged down by a large firm mass, which seemed to extend around to the posterior vault, and was extremely tender. Satisfactory palpation of this mass was impossible, due to spasm. A second examination, four days later, showed this mass to be slightly fluctuant in places, and slightly less tender. Examination by speculum was unsatisfactory.

Laboratory findings: Smears of cervix and urethra positive for gonococcus. Wassermann negative. Urine: Findings not remarkable. Blood: r. b. c. 3,140,000; w. b. c. 18,000 (70 per cent polymorphs). Hemoglobin: 60 per cent.

Progress and Operation: The patient was put on an antiinfectious regime and watched for six days, during which time her temperature was down to normal at only one reading. Her general condition remained about the same.

A diagnosis of bilateral acute or subacute salpingitis, with left pyosalpinx and possible abscess of the left broad ligament, was made. On the seventh day following admission, under gas oxygen anesthesia, a small incision was made into a fluctuant area on the mass protruding into the left vault. A small amount of old dark blood and some clot was extruded. No pus appeared. A drain was inserted. The abdomen was then opened and free bloody fluid found in the peritoneal cavity.

At the left tubal ampulla there was a mass the size of a lemon, composed of old clot, and containing the distal end of the left tube and the left ovary. There was fresh blood oozing from the lateral extremity of this mass. "Sections of this mass," according to the pathologic report (Dr. Warren Hunter), "disclosed chorionic villi in the clot, within the tube. No evidence of disease within the tube itself is seen." The operative report states that chronic salpingitis was found in the right tube. There is no pathologic report on this tissue.

COMMENT

The salient diagnostic points may be summarized as follows:

Against infection: History of no exposure, denied symptoms of acute infection below, absence of stigmata of chronic infection.

Indicating infection: Smears, positive for gonococcus. White count 18,000, 70 per cent poly's; temperature and pulse; clinical picture mild; no shock; ruptured hymen.

Against ectopic pregnancy: (with rupture). History: No exposure, no signs or subjective symptoms of pregnancy; menstrual regularity; absence of shock (as evidence of rupture); absence of typical severe pain; diagnosis of acute infection (seemingly definite); age of patient (initial pregnancy also).

Indicating ectopic pregnancy: Red count and hemoglobin (3,140,000 and 60 per cent); clinical picture (more suggestive of infection).

The diagnosis of infection was made on the basis of the positive smears, temperature, white blood count and pelvic findings. Ruptured ectopic pregnancy was considered.

The picture was confused by several factors: The patient denied exposure, was apparently menstruating normally at admission and gave a history of previous normal periods. She denied the subjective symptoms of pregnancy. There was no secretion from the nipples or other breast change. Chadwick's sign was negative. There was a history of severe pain which, however, started in the epigastrium, was not characteristically sudden in onset, and not of the lancinating type generally associated with rupture. The age of the patient (eighteen years) and the assumption that if a pregnancy, this would be her first, was definitely against the diagnosis. Ectopic pregnancy is rare in women under twenty years of age, especially as a first pregnancy. The accepted diagnosis of present acute infection was used as evidence against an ectopic pregnancy.

It has been sugested that, if a true history, with admission of exposure had been obtained, the diagnosis would have been less confusing. I am not able to see how an admission of intercourse could have swayed the evidence seriously in favor of ectopic pregnancy as against acute infection. Of course, the cooperation of the patient should be obtained in such a case, and it is my experience that an attitude of interest and sympathy is more effective than the usual "brow beating" tactics of the charity ward.

The mass in the cul-de-sac should have been needled rather than incised, thereby averting much of the danger of infection from below. Free drainage could have been established following the finding of pus. Following the conservative tendency in the treatment of pelvic infections, I would point out that repeated needling and evacuation of a pelvic abscess is rational treatment, and should perhaps be given a more thorough trial.

Besides raising some of the more common factors tending to obscure the diagnosis of ectopic pregnancy, this case presents the question of whether the presence of acute salpingitis should be used to rule out the diagnosis of ectopic pregnancy. It is commonly understood that chronic or past infection of the tubes predisposes to tubal implantation of the ovum. It is by no means established, however, that acute inflammation of the tubes excludes the possibility of an ectopic pregnancy.

Culbertson reports four cases in which there was a tubal pregnancy associated with "suppuration." In only one case, however, does he clearly establish that the infection was preexistent and not dependent on conditions due to the tubal pregnancy. An analysis of Smith's tabulated report of 191 cases shows that in only two of these (1 per cent) was there an independent active infectious process. One of these was an active pus tube containing an ectopic pregnancy, and the other a pus tube opposite to a tubal pregnancy. "Inflammation" in the opposite tube is reported in four cases, in two of which, as in the case which I am reporting, there was no evidence of infection in the tube containing the pregnancy. In 46 cases (24 per cent), changes are reported in the oppostite tube due to past or chronic infection. Unfortunately, his brief tabulated reports only occasionally definitely exclude the possibility of associated disease (acute or chronic) in the pregnant tube. It is also possible that the congestive changes due to the pregnancy may have obscured the picture of mild infection in the pregnant tube.

In 50 cases reported by Kelly, and 91 cases by Poole, there is no mention of the asociation of active independent disease of the tube affected, nor is any mention made of this association in the textbooks. Chronic or past infection is given as a frequent predisposing cause.

From this brief analysis of about 340 cases it appears obvious that while possible, the association of active disease of the tubes with tubal pregnancy is rare, and that for this reason the diagnosis of acute tubes should have a definite value in helping to exclude the diagnosis of tubal pregnancy. Since there seemed definitely to be an acute process in the case which I have reported, I think we were justified in using it as against ectopic pregnancy.

545 Medical Arts Building.

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TUBERCULOUS CONDITIONS OF THE GENITOURINARY TRACT*

THEIR NONOPERATIVE TREATMENT

G. I. Birchfield, M.D.
SEATTLE, WASH.
Medical Examiner, Veterans Bureau

Before taking up the treatment of tuberculosis of the urologic tract it will be advisable to make a few comments on the importance of a thorough diagnosis or the manner in which it should be made.

The most important factors are these: Early diagnosis is easily made by the modern methods and have shown not only the great interest but the great importance of tuberculosis of the genitourinary system. While it is not as often encountered as other forms of tuberculosis, such as the lungs, glands and bones, it is common enough to demand eternal vigilance on the part of the practitioner in the hope of its early recognition and treatment. Too often tuberculosis of the kidney goes unrecognized for months or even years, with the result that a unilateral affection is allowed to become bilateral and the prognosis altered from a favorable to a hopeless one, or a descending bladder tuberculosis develops with its resulting misery.

This is a subject of too great importance to pass over without mentioning briefly the diagnostic methods and the factors or the symptomatology. The symptoms and signs are local and general. The first of these are manifested by slight increase in urination, first noticed during the day; second, having to get up once or more times at night. These increase and the patient is compelled to void every hour or two during day and night. These cases coming to the average practitioner are treated as cystitis for months, often allowing the condition to spread from kidneys to bladder, thence to prostate or seminal vesicles, epididymis or testicle.

I have made it a point to make a complete urinalysis, including special stain for tuberculosis in all cases where blood is found without a cause. When staining for tuberculosis in urine of this kind, the urine should be centrifuged immediately after it is voided. In three recent cases of hematuria, where no cause could be determined, tubercle bacilli were found.

The most important methods in determining an early diagnosis are cystoscopy and ureteral catheterization. There are many other features that are important but time will not permit going into detail.

TREATMENT

The treatment from a general medical standpoint should be the same as for pulmonary conditions, consisting of general hygenic and constitutional procedures. There has been in my opinion too much stress laid upon the tuberculin treatment. The only cases that I have found to receive an appreciable amount of benefit are those in which an early diagnosis has been made. As to drug treatments, there are none that can be recommended except capranol, but this only clears up any other organisms that are so often found in genitourinary tuberculosis, especially that of the kidney and bladder.

Rytina makes a practice of dilating the ureter every three or four weeks. This relieves the renal colic and gives a free drainage to the kidney. Lavage seems to do more harm than good. Local treatments of the bladder are not desirable, at least this has been found true in our cases.

Treatment of the epididymus should be conservative, consisting of hygenic and diatetic measures. Several cases have come under my observation within the last year that have been operated on, where testicle and epididymus have been removed; others where more conservative treatment has been adhered to. In comparing these cases I have found the nonoperative cases to have fewer complications and a better mental attitude toward life.

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* Read before Seattle Surgical Society, May 28, 1926.

The treatments that have produced the most satisfactory results have been dietetic, hygenic, specified rest periods and heliotherapy. The latter has been a great aid to medical science, and particularly to the urologist in the treatment of tuberculosis. One form has been within the reach of all from the beginning of time, the sun rays.

In the last year I have had the opportunity to compare the difference in treatments between sun rays and artificial rays in the treatment of tuberculosis of the urinary tract. The artificial treatment has proved more satisfactory, especially in the epididymus. This was demonstrated by giving artificial treatment for a period, then changing to sun rays. The patient's condition in a short time became worse and he was put back on Kromayer light, and the change brought about was remarkable.

There are two methods of giving artificial treatments. One is the localized or Kromayer and the other the general or Alpine. The Kromayer is used in treating epididymus, testes, seminal vesicles and prostate. This is done by starting with five seconds exposure and gradually increasing as the patient's tolerance increases, using some pressure.

The Alpine or general treatment is used in treating kidney and bladder with the light directly over the affected area, starting at a distance of 38 inches. First use exposure of three minutes at a time and increase a minute at a time with lights at the same distance until twenty minute treatments are reached, depending on the tolerance of the individual.

These patients are greatly benefited by the aid of hydrotherapy, following the general treatment. They are given a hot shower followed by a cool spray.

In conclusion, permit me to say that the important factors are early diagnosis, rest and proper diet, together with general hygenic measures which should be emphasized above all others. The diet should be one producing an alkaline reaction of the blood. Remember that there is no one thing that will cure tuberculosis of the genitourinary tract.

A CASE OF ACUTE YELLOW ATROPHY OF THE LIVER

KENELM WINSLOW, M.D.
SEATTLE, WASH.

The patient, a trained nurse, was a stout, robust woman of forty with a history of excellent health until fourteen years ago, when she suffered severe pain in the epigastrium lasting a few hours and was confined to the house for two days. Four years later she had a similar but milder attack and was laid up one day. Since that time she has been unusually strong and well.

Coming west on a train she began to have nausea which continued during the trip and after she reached home, or a week in all, when she had an attack of vomiting with the expulsion of a little bright blood. Then for the first time she experienced a constant dull pain in the epigastrium, soreness over the gallbladder region and in the right back, together with occasional pain in the right side and "catching of the breath" on deep inspiration and, a few days later, jaundice appeared with passage of dark urine and clay colored stools.

At this time tenderness was extreme on pressure over the gallbladder, and to a less degree under the angle of the right scapula. The temperature and leucocyte count were normal. The pulse was of good quality and about 80. The urine was negative except for a trace of sugar and an excess of bile. The direct van den Bergh reaction was diphasic, and the indirect showed 15.5 mg. of bilirubin in 100 c.c. of serum (normal 0.5). The icterus index was 25. Hemoglobin and red cell count normal and Wassermann test negative. The coagulation time was 9 minutes.

The patient did not seem very sick, was bright, had a fair appetite, slept well, and only complained of weakness and jaundice and occasional vomiting after a week of the epigastric pain. The pain was not severe enough at any time to require anything but external heat with an electric pad.

The jaundice was rather intense but not greenish or abnormal in hue. On the nineteenth day of sickness and the fourteenth of jaundice, the patient became suddenly much worse and awoke confused and remained in a somnolent state for some hours but later seemed as bright as usual. But on the following morning she was wholly comatose, with rapid pulse, retention of urine and in constant motion. This general state continued unabated, with failing heart and respiration, until she died forty hours later.

The previous history and present attack suggested at once a chronic cholecystitis with a subacute exacerbation and this was confirmed by the extreme tenderness of the gallbladder. In the absence of fever, stone in the common duct, chronic pancreatitis or carcinoma of the head of the pancreas (sugar in the urine), and acute yellow atrophy were chiefly considered in differential diagnosis. Osler in his peerless Practice of Medicine stated, regarding diagnosis of acute yellow atrophy, "Jaundice with vomiting, diminution of liver volume, leucin and tyrosin in the urine, form a characteristic and unmistakable group of symptoms."

And again that "In the majority of cases no bile enters the intestines and the stools are clay colored."

This patient vomited bile at times and in the latter part of the sickness there was some bile in the feces. According to Osler there were only three cases of acute yellow atrophy in twenty-three years at Johns Hopkins Hospital and the disease is rarer in this country than in England and Germany. Since vomiting was slight in this case, and there was no diminished area of liver dullness, nor leucin nor tyrosin in the urine, the diagnosis of acute yellow atrophy did not seem warranted by the facts.

It was thought advisable to explore the liver and ducts for possible obstruction by stone and this was done by Dr. J. Tate Mason, after intravenous calcium chloride injections and blood transfusion. The liver appeared practically normal in appearance and to the touch, although somewhat small. No sufficient changes were evident to justify the diagnosis of acute yellow atrophy, I think all present agreed, among whom was Dr. Alfred Straus of Chicago, who had previously made a diagnosis of acute yellow atrophy after seeing the patient in consultation. He perhaps deserves greater credit for making the diagnosis in the total absence of characteristic symptoms and signs.

The gallbladder was small, contracted, congested and thick walled. In the place of the head of the pancreas there was a hard mass, and enlarged lymph nodes were felt along the larger bile ducts. The common duct was opened and a probe passed up into the hepatic duct, and down through the common duct and ampulla of Vater into the duodenum, proving absence of stone or other obstruction. Moreover, there was no dilatation of the ducts. The patient was nearly moribund before the operation but the transfusion seemed to improve her condition for a time, despite the surgical interference.

At autopsy the following day the operative findings were confirmed regarding the gallbladder and pancreas, the head of which was somewhat enlarged and quite hard from fibrosis and chronic inflammation. The gallbladder contained bile so thick that it was removed by the fingers in one sticky, tarry mass that blocked the cystic duct. The liver was smaller than usual but without abnormal surface discoloration. It was not flabby, nor was the capsule wrinkled and, as a whole, it seemed normal to touch. But the cut surface of the liver was bright yellow from bile staining, so characteristic of acute yellow atrophy. Dr. O. J. West prepared some beautifully stained sections, microscopically confirming the diagnosis in showing wide destruction and necrosis of the liver tissue, and marked fatty changes in the cells, some of which were reduced to mere structureless fatty debris.

Comments. Characteristic symptoms depend upon the stage of the disease. In this patient there was not sufficient destruction of liver cells to give rise to leucin and tyrosin, one or the other being present in 72 per cent and both being absent in 28 per cent of cases. Necrosis was not far enough advanced to induce marked shrinkage of the liver and wrinkling of its capsule. Cerebral symptoms are marked but these also occur in severe jaundice from other causes, as stone in the common duct. The jaundice in this patient was deep but not greenish, as often reported in yellow atrophy. Subjects are reported as seeming very ill but this was not noted till forty hours before death.

Etiology is uncertain but yellow atrophy is not infrequently a terminal stage of other liver disorders, as catarrhal jaundice, hepatitis, gallbladder disease and the cirrhoses, due to impairment of liver resisitance to infection. Specific infection is questionable but not improbable. As is well known, the disease is peculiar to pregnant women after the seventh month, and is sometimes caused by chloroform, arsphenamine and other chemical agents.

BEE STING TREATMENT

W. Ray Jones, M.D.
SEATTLE, WASH.
Member Washington State Beekeepers Association

Within the past two years there have been in Washington three bee sting deaths. Of course there must have been more in the entire United States. Some of these could have been saved, had the information been general that adrenalin is specific for apipuncture.

Bee stings like other human ailments vary in severity because of, first, virulency and amount of poison; and, second, resistance of the individual. Bee poison contains two distinct toxins, the one a powerful local irritant, the other a general body poison.

The local irritating effect is supposed to be due to formic acid. Bee toxin is decidedly acid to litmus. The reactions very much resemble anaphylaxis and foreign protein poisoning. Apipuncture in sensitized persons gives, first, the same initial suffocation and bursting feeling as anaphylaxis, and, later, the localized swelling, subcutaneous hemorrhages, heart weakness, etc., as in foreign protein poisoning.

This explains the seeming greater sensitiveness to bee sting in other members of the beekeeper's family. They get merely enough bee poison to be sensitized, but not enough for establishing an immunity such as the beekeeper himself has.

Braun (Cape Town, *S. A. M. R.*, Sept. 26, 1925, Abs. *J. A. M. A.*, Dec. 12, 1925), scientifically worked out a method of desensitizing these people. He prepared a toxin by grinding the rear one-eighth of the bee's abdomen in salt water. He then filtered and diluted to a definite standard of toxicity. Standardization was done by rubbing one drop of this poison on a scarified but not blood-drawn area of a sensitive skin. The effect for each minute was observed and dilution made to obtain a definite amount of reaction in a definite time.

He controlled the reactions, stopping the same with injections of adrenalin. In other words, adrenalin hypodermically is specific for the general body reaction to bee sting.

An important thing to remember is that people can be desensitized to apipuncture by injecting gradually increasing doses of this toxin. Of course, the initial dose is much less than the bee would inject. It is increased until they acquire a large amount of immunity. Theoretically and scientifically this is very good, but practically valuable only in selected cases. It is a big task to make the toxin and a long drawn out and painful procedure to desensitize the individual.

Adrenalin injected locally where the wheal forms is of little real value for relieving pain. Usually the needle and adrenalin hurt more than the bee sting. If used at once it retards the swelling but not the pain.

It is dangerous to those suffering from high blood pressure. It very quickly oxidizes to an absolutely inert substance, hence must be fresh. The standard liquid is preferable to the tablets.

Medical texts are at present blank on efficient remedies for bee toxin. Not every physician would notice the close similiarity of bee poisoning, foreign protein poisoning and anaphylaxis, and accordingly use adrenalin. As a general thing, the beekeepers are much better informed on the value of adrenalin in bee sting than are the doctors. Experience seems to be a good teacher.

HERNIATED GANGRENOUS APPENDICITIS

SIMULATING STRANGULATED INGUINAL HERNIA

Frank W. Milburn, M.D.
REARDAN, WASH.

The following case has several points of interest, namely, the infrequency of acute appendicitis in infants, the infrequency of herniated acute appendicitis, with the resulting inflammatory changes in the spermatic cord, which in this case resulted in the hasty and mistaken diagnosis of strangulated inguinal hernia.

CASE REPORT

History. F. E. G., age six weeks, six days. Breast fed. Had three choking spells during the night of August 14, 1926, at which time the baby coughed violently and was apparently trying to expel something from the throat.

On the following day the patient was quite restless, moved its feet excessively and cried at intervals. The mother noticed a swelling in the right inguinal region during the afternoon of the fifteenth, and consulted me about six in the evening.

Examination. Upon examination, I found the temperature 101.2°, pulse 140, respiration 30.

A swelling was noted over the right inguinal canal, apparently protruding from the external ring and extending into and filling the right sarotal sac.

Operation. The patient was operated on at the Community Hospital about eight o'clock in the evening, under ether anesthesia. A Bassini incision was made, and a swollen spermatic cord was observed, the enlarged cord completely filling and distending the right scrotum, and having a diameter of about 20 mm. A smal hernial sack was dissected free, opened and found to contain an acutely inflamed appendix, with a small gangrenous area at the tip. The appendix was removed, sac ligated and wound closed in the usual way.

On section a bristle 5 mm. long was found in the lumen of the appendix, located in the base of the gangrenous area, which was no doubt swallowed the previous night.

The patient took the anesthetic smoothly, made an uneventful recovery from operation, leaving the hospital on the ninth day.

Merbaphen (Novasurol) as Diuretic in Congestive Heart Failure. A comparison of the diuretic effectiveness of merbaphen with that of the drugs previously available, has been made by H. M. Marvin, New Haven, Conn. (Journal A. M. A., Sept. 25, 1926), using patients who responded to both types of treatment as well as those who failed to react to the usual therapy. Theophylline and theobromine were used as the control diuretics. The patients selected for study were those with advanced congestive heart failure characterized by large amounts of edema; no selection was made on the basis of age, sex or etiologic type of heart disease. Those with evidence of renal disease were excluded. Merbaphen has been administered in doses of 1 or 2 cc. by intramuscular or intravenous injection to twenty-six patients with advanced congestive heart failure. Seventeen of these received adequate doses of digitalis and theophylline or theobromine; fifteen had repeated doses of both merbaphen and theophylline over a long period. Merbaphen and theophylline each failed to cause diuresis in seven instances. Of the seven who failed to respond to theophylline, four subsequently responded very well to merbaphen. Of the seven merbaphen failures, two subsequently had excellent diuresis from theophylline. Only three patients failed to respond to both. Theophylline caused intense diuresis in a total of five patients, merbaphen in four. Eight of the nine excellent results were obtained in patients with arteriosclerotic heart disease. Ammonium chloride was used in conjunction with merbaphen in four patients. In three, the combination was more effective than merbaphen alone; in the fourth, a comparison was not made. Merbaphen alone was given to nine patients before they had received digitalis. There was moderate diuresis in seven, excellent in one, and no change whatever in one. Eight of the nine subsequently obtained excellent diuresis from digitalis alone or in combination with theophylline. In every instance, the response to the usual treatment was better than that to merbaphen. Toxic effects of merbaphen were observed in eight patients of the twenty-six; stomatitis and salivation in four, bloody diarrhea in two, sterile abscesses in two (after intramuscular injection), and collapse in one. Only one patient exhibited more than one of the foregoing effects.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho and Montana

Devoted to the interests of the Medical Profession of the Pacific Northwest

Editorial Office, 543 Stimson Building, Seattle, Wash.

OCTOBER, 1926

EDITORIAL

THE CARBON MONOXIDE MENACE

Since the days of antiquity have appeared references to death from carbon monoxide poisoning. As long as coal has been mined there have been appalling tragedies from the same gas. Everyone is familiar with the use which has been made of illuminating gas and the charcoal brazier as an easy means of exit for self destruction. It has remained for the present age, however, to produce the greatest extension of this method of poisoning through the automobile exhaust, whence great quantities of carbon monoxide are ejected. Not infrequently one notes an item in the morning paper of a man being found dead in his garage, engine running and doors closed.

An intensive study of this problem has recently been made by a Committee on Public Health Relations of the New York Academy of Medicine.* Their study of the problem has been especially directed to its consideration in the city. There has been a discussion as to whether the fatal element consists of the deprivation of oxygen with resultant injury to the brain and other organs, or whether the carbon monoxide causes a specific action upon the central nervous system through the circulating blood, with resulting paralysis of the heart's action. There seems to be a consensus of opinion in favor of anoxemia being the prime factor, but there is probably a specific toxicity of the gas in addition to this. It has been observed that the dangers from this gas are not confined to the enclosed garage but are frequently observed to affect automobile mechanics working in close proximity to the idling engine, who may display the characteristic carbon monoxide headache and nausea. The same condition may appear in the driver who travels along the highway in a slow procession behind a large bus or truck. It has been suggested that some highway accidents may have been precipitated by a driver thus affected. It has frequently been observed that the traffic officer at the most congested crossings in large cities habitually goes home at night with this form of headache and general weakened condition. It has been estimated that by 1930 there will be a million automobiles in New York City. It is fertile source of speculation as to the degree of contamination which this gas may impart to the atmosphere of that city.

Several remedies have been sugested for this condition. If the exhaust pipe were carried above the top of the car, so that the gas were projected well above the heads of pedestrians, some relief would ensue. It is stated that it is possible to produce a form of gasoline, whose combustion will eject a smaller amount of carbon monoxide than is found at present. It is claimed that carbureters have been designed that can be so adjusted as to have 2 per cent or less of carbon monoxide in the exhaust, while at present the average car ranges as high as 14 per cent. It has been proposed that, as a health protective measure, legislation might be enacted forbidding a greater carbon monoxide content than 4 per cent volume, which would go far to relieve the deleterious effects of the exhaust gases. Since public attention has been directed to this problem, and it is recognized as affecting all automobile drivers to a greater or less extent, remedial measures will doubtless be enacted which will overcome the menace as it now exists.

CLEAN CANDY

After making a round of confectionery shops one may well wonder if there is such a substance as clean candy, even in the best and most expensive places. Candy is consumed largely for the pleasure it gives which is enhanced by the knowledge that it is made of pure materials, put up attractively in form and color, in pleasing packages, and with scrupulous attention to neatness. Some of these qualities are nearly always lacking. Lack of cleanliness takes away the desire for candy more than any other oversight. It is not an agreeable duty to destroy someone else's pleasure and peace of mind, but at the risk of so doing it is here suggested that our readers observe the methods of handling candy, especially candy which comes loose, that is not already put up in packages.

Too often the girl who dispenses candy also serves as general cashier. Scoops are not usually provided and she dips up the candy with her hands, then collects for it, often handling paper money, than which few things are filthier. The writer has yet to find a candy shop, in which there is a washstand convenient to the serving counter, or to observe any saleswoman wash her hands after handling money. Often the habits of the saleswomen in other ways are far from fastidious. Too frequently they toy with their hair, dig their scalps with their brilliantly shining but far from surgically clean finger nails, and in a multitude of other ways bring their hands in contact with sources of contamination. In many shops flies add to the pleasures of the purchaser but this phase of uncleanliness need not here be further considered for the reason that shops, in which this particular source of contamination exists to any noticeable extent, are beyond the pale, hopeless, and can only be reached by drastic measures. It is to be hoped that readers will do as the writer has done on several occasions, call attention of saleswomen, or better still of proprietors, to the careless and dirty practices herein commented on and to notify such persons with conviction that if they continue there will be at least one customer who in the future will be conspicuous by his absence.

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* Carbon Monoxide Poisoning and the Automobile Exhaust. By Special Subcommittee of the Committee on Public Health Relations. Abstract of Reprint from Bulletin of New York Academy of Medicine, August, 1926.

City health boards might require that every candy shop shall have a convenient wash stand provided with soap and towels for the use of sales folks, and that, at least in large shops where it is feasible, an effort should be made to insure that the candy dispensers shall cease to combine that job with the duties of cashier. In cities in which health boards rate restaurants according to cleanliness, this may well be considered in ratings. If proprietors of candy shops regard interference of this kind as an imposition, it might be pointed out that many people who have observed carelessness such as is here discussed buy candy reluctantly or not at all, and that if these faults are corrected, the sales of candy will undoubtedly increase more than sufficiently to cover the additional costs of dispensing in a cleanly and inviting fashion.

THE SANDPOINT MEETING

The thirty-fourth annual session of Idaho State Medical Association was held September 2-4, at Sandpoint, headquarters being in the Hotel Ponderay, where registration was in charge of Dr. Ethel Page Westwood. The scientific program was one of unusual excellence. The papers presented by members of the Idaho Association compared very favorably with those of specially invited guests from San Francisco, Vancouver, B. C., Portland, Ore., Spokane and Seattle. The above statement is not made with any intention of decrying the quality of the papers presented by the foreign visitors. Any local presentation must necessarily have been of high class to be this favorably spoken of. Most if not all will be available to the general profession through the columns of Northwest Medicine during the coming year.

The social features were well attended to by an evening boat ride on beautiful Lake Pend d'Oreille, and the following evening by a banquet at the Elks' Club. The address by President N. R. Wallentine, given on that occasion, was a thoughtful presentation of the ecenomic problems and difficulties faced by the association. One could not but be impressed during the speaking and discussion which followed by the very evident interest taken in the Public Health League of the State of Idaho. Its works were warmly commended and promise of financial support was fully given. Paul Davis, executive secretary, came in for considerable commendation by the state's physicians. Various men from without the state spoke on allied subjects and Dr. John M. Dodson, of the Bureau of Health and Public Instruction of the American Medical Association, gave a broad-minded definition of the aims and ends of that Bureau. Dr. D. L. Alexander of Twin Falls was elected president for the ensuing year, and the meeting next year will be held in that city. One cannot but look forward with pleasure to next year's meeting and back with pleasant memories to that just completed.

MEDICAL NOTES

Travel Study Club of American Physicians. At the completion of its recent European Study Tour, the Travel Study Club of American Physicians elected Dr. Fred H. Albee of New York as President, Drs. Edward B. Heckel of Pittsburgh and John P. Lord of Omaha as Vice-Presidents, and Dr. Richard Kovacs of New York as Secretary. Plans are being prepared for the next study trip, including the Central European countries: Germany, Austria, Czechoslovakia, Hungary and Italy.

OREGON

Eastern Oregon Tuberculosis Sanatorium Needed. The Oregon Tuberculosis Association has planned an intensive campaign for the location of a sanatorium in the eastern portion of the state. According to Mr. A. L. Mills, president of the association, the facilities of the present institution at Salem are totally inadequate.

Veteran's Hospital Assured. As soon as the title to the land has been provided, bids will be asked for the construction of the new $1,300,000 Veterans' hospital on Marquam hill, Portland.

Addition to Hospital. There has recently been completed a two-story addition to the Portland Surgical Hospital, which provides space for the Coffey Clinic and for fourteen new rooms for patients.

STUDY WORKMAN'S COMPENSATION ACT. The legislative committee appointed by the state legislature to investigate the medical aspect of the workman's compensation act, held a meeting at Salem, August 27. The members of the committee are Drs. A. B. Starbuck, Dallas; W. A. Kuykendall, Eugene; Hugh Mount, Oregon City.

NOTED FOREIGN VISITOR. Dr. Adolph Gehrcke, professor of internal medicine at the University of Hamburg, Germany, was the guest of Drs. Ralph C. and Ray W. Matson, of Portland, in September. He is en route home after eighteen months of study of special diseases and particularly tuberculosis. Most of this time was spent in Ceylon, the Dutch East Indies and the Straits Settlements. Dr. Gehrcke is one of the foremost of European authorities on tuberculosis.

THE AMERICAN MEDICAL ASSOCIATION would favor the holding of its 1928 convention in a Pacific Northwest city, according to Dr. Joseph A. Pettit, of Portland, who recently returned from a meeting in Chicago of the board of trustees of the national association.

LECTURES ON POLIOMYELITIS. Dr. Harold Amoss, of the Rockefeller Institute of New York, gave an address at the University of Oregon medical school September 11, on the subject of "Experimental Poliomyelitis."

DR. GEORGE PARRISH, former director of the Portland health department and now health commissioner of Los Angeles, Calif., was a recent visitor in Portland.

DR. ROWLAND ALLEN, of Portland, has joined the Southern Oregon Clinic of Ashland.

DR. GEORGE JORDAN has located for practice at Albany.

MEDICAL WEDDING. Dr. H. M. Peerry and Miss Ghylnn Clark, of Marshfield, were married August 2. They have left for a trip to Europe, where Dr. Peerry will engage in postgraduate study.

WASHINGTON

ORTHOPEDIC MEETING. The annual meeting of the Seattle Orthopedic Society was held Sept. 10-11, with Dr. Willis C. Campbell, of Memphis, Tenn., as the guest speaker. The morning sessions were devoted to clinics. At the annual dinner, Sept. 11, Dr. Campbell discussed "Arthoplasty of Weight-bearing Joints." This lecture was ingeniously illustrated by the use of moving picture cartoons which depicted the various steps in the operation involved.

GENERAL CLINIC CONFERENCE. The Spokane Clinical Society, which was recently organized by several Spokane physicians for the purpose of promoting clinical and investigative study, held a clinical conference Sept. 16-17, to which the physicians in the surrounding district were invited.

STUDY SEATTLE HOSPITAL NEEDS. During the past month, Mayor Bertha Landes and Commissioner of Health E. H. Hanley, of Seattle, inspected several city and county hospitals in California. The purpose of their investigations was to gain ideas which would aid them in an early consideration of the hospital needs of Seattle and King county. The present facilities for the care of the sick have long been inadequate.

TO ESTABLISH HOSPITAL IN CHINA. Dr. John W. Unis, for the past year a member of the resident staff of the Seattle City Hospital, sailed on Sept. 7 for China. Under the auspices of the Augustana Synod, Dr. Unis and his wife will establish a hospital at Hsuchow in the province of Honan.

HEADS MCCLEARY HOSPITAL. Dr. Francis E. Schovalain has taken over the management of the McCleary General Hospital from Dr. B. E. Fleming, who has left for a period of postgraduate study in New York, after which he intends to locate in Olympia.

BIRTH CONTROL EXPERT SPEAKS. Dr. James Cooper, medical director of the American Birth Control League, recently discussed the subject of birth control before several medical societies of the state.

CANCER SPECIALIST VISITS NORTHWEST. Dr. H. E. Scott, of Temple, Texas, whose method of excising malignant growth by the red hot cautery has attracted the attention of the foremost authorities on cancer, was a recent visitor at Longview.

PHYSICIANS IN LEGISLATURE. At the primary election the following physicians were nominated for the state legislature who will be duly elected in November. For the Senate: Drs. Warner Karshner, Puyallup; J. C. McCauley, Ellensburg; Walter J. Taylor, Port Angeles. For the House: Drs. J. A. Durrant, Snohomish; A. F. Brockman, Bickleton.

STATE BOARD OF HEALTH. Gov. Hartley has appointed the following men to constitute the State Board of Health: Drs. J. H. O'Shea, Spokane; S. L. Caldbick, Everett; C. A. Smith, Seattle; J. H. Egan, Tacoma.

DR. H. J. GREER, who graduated from the medical school of Toronto University, has located for practice in Mount Vernon.

DR. STEWART DOOLITTLE has established an office in his new home at Richmond Highlands.

DR. HORACE G. MILLER, formerly of Beatrice, Neb., has opened an office in Ellensburg.

DR. J. W. MOUNSEY has moved to Seattle where he will engage in practice.

DR. EMMA MORGAN, of Chicago, has opened an office in Bellingham. She will confine her practice to diseases of the eye, ear, nose and throat.

DR. F. C. MYERS has located at Medical Lake. He has previously been engaged in the Indian Field Service in Utah.

DR. T. H. GROSVENOR, of Wenatchee, has been seriously ill at the Seattle General Hospital.

DR. GEORGE W. WIMBERLLY, of Toppenish, is convalescing from a recent severe illness.

DR. F. J. CLANCY, of Seattle, has sailed for Europe, where he will study for six months.

IDAHO

Public Health Lecture. Dr. John M. Dodson, of Rush Medical College of Chicago, secretary of the Bureau of Public Health of the American Medical Association, addressed a public meeting at Sand Point Sept. 1, on the subject of "Team Work by the Doctors and Laymen for Health Betterment." He stressed particularly the need for uniformly periodic health examinations. Dr. Dodson was also one of the guest speakers of the meeting of the Idaho State Medical Society.

Heads Spanish Veterans. Dr. T. J. McLin, of Boise, was recently elected president of the Idaho department of the United Spanish War Veterans.

President of Board of Trade. Dr. F. L. Quigley has been made president of the Wallace board of trade for 1926-27.

New Officers Elected. The following officers of Bonner County Society have been elected for the ensuing year: President, Dr. E. E. Fry, Bonners Ferry; Secretary, Dr. N. R. Wallentine, Sand Point.

Appointed State Medical Examiner. Dr. C. F. Hanmer, of Salmon, has been appointed a member of the State Board of Medical Examiners.

Dr. G. G. Espe, formerly of Spokane, has located for practice at Nampa.

Dr. C. H. Gavin, recently of the Los Angeles naval base hospital, has opened an office at American Falls.

Medical Wedding. Dr. R. C. Romig, of Moscow, was married to Miss Pauline Pence, of Payette, August 14. He will be associated with the medical staff of the University of Oregon, Eugene.

MONTANA

The State Graduate Nurses' Association held its annual meeting at Kalispell July 19-21. Dr. Fred L. Adair, Professor of Obstetrics and Gynecology at the University of Minnesota, addressed the meeting on maternal hygiene.

Dr. C. E. K. Vidal, Superintendent of the State Sanitarium at Galen, was granted permission by the State Board of Examiners to attend the meeting of the International Union against Tuberculosis to be held in Washington Sept. 30-Oct. 1-2. He will also visit a number of state tuberculosis sanatoria and will be Montana's official delegate to the American Public Health Association's meeting held in Buffalo Oct. 11-14.

Noted Pathologist Speaks. Dr. J. J. Moore, director of the National Pathological Laboratories, Chicago, and formerly professor of bacteriology and pathology at the University of Illinois, addressed the members of Western Montana society at Missoula August 24, his topic being "Laboratory Standardization." He declared there should be a standardized laboratory in every city having a population of 12,000 or over, and outlined the requirements of an acceptable laboratory.

Osteopaths Complain. At the recent convention of the Montana State Osteopath Association, a resolution was made in which it was alleged that certain Montana hospitals are uniformly denying their facilities to osteopath physicians. It is stated that this policy is often followed in hospitals supported by individuals who themselves desire osteopathic treatment.

Dr. Edith Hale Swift, representing the American Social Hygiene Association, will spend the first two weeks of October in Montana, lecturing on social hygiene. Her itinerary includes the State Normal School at Dillon, Intermountain Union College at Helena, the annual meeting of the state conference of social work at Great Falls and the biennial meeting of the state Federation of Women's Clubs at Livingston.

Montana State Conference of Social Work will hold its annual meeting in Great Falls, Friday, Oct. 8.

Dr. A. J. Chesley, secretary of the Minnesota State Board of Health, visited the Montana Board of Health Sept. 9 to 14.

OBITUARIES

Dr. Walter H. Lott, of McMinnville, Ore., died suddenly of heart disease at his home Sept. 6, aged 39 years. He was born in 1887 at Westport, New York, and graduated from George Washington medical school, Washington, D. C., in 1913. He practiced in Westport before locating in McMinnville in 1919. He was president of the Marion-Polk-Yamhill Society.

Dr. Leonard Dell, pioneer physician of Athena, Ore., died August 13 at St. Mary's hospital, Walla Walla, Wn., following a protracted illness, aged 88 years. He was born in Green county, Tenn., in 1838 and graduated from McDowell medical college. He was engaged in practice at Athena from 1886 to 1900, when he retired.

Dr. William Grant McGee, a resident of Nehalem, Ore., for the past fifteen years, died at Tillamook August 18, aged 63 years. He was born in Chandlersville, Ohio, and graduated from Hahnemann Medical College, Chicago, in 1889. He located in Tillamook in 1912 and practiced there for eight years before moving to Nehalem.

Dr. O. A. Kells, of Kirkland, Wn., died August 27 from a skull fracture, sustained when his automobile overturned on the highway near Juanita Point. He was born in 1886 and graduated from the Minneapolis College of Physicians and Surgeons in 1908. Before locating at Kirkland in 1924, he had practiced at Issaquah.

Dr. Charles T. Riggs, of Port Angeles, Wn., died at his home August 27, aged 80 years. He was born at Aurora, Ind., in 1846, and in his youth served with the Indiana Volunteers in Indian Scout duty and later in the Civil War. He practiced for many years in middle western states, and later moved to Chewelah, Wn. He went to Port Angeles in 1919.

Dr. Sarah Kirby Gibson, of Walla Walla, Wash., died at St. Mary's hospital, September 18. Death followed an operation which was necessitated by injuries received in an accident in June. She was born in Dayton, Wash., in 1874, and graduated from the American Medical Missionary College, Chicago, in 1900. She had practiced in Walla Walla for the past ten years.

PUBLIC HEALTH LEAGUES

WASHINGTON

FIVE PHYSICIANS IN LEGISLATURE

The health forces of Washington united during the recent primary and proved to have powerful influence in the settling of many legislative fights. Several candidates for the House and Senate who had led the fight against health measures ran far behind in the totals. Others who had been outspoken in favor were returned by heavy majorities.

The three cult candidates, two for the Senate and one for the House, were left far behind. In Pierce county, Dr. Goff, osteopath, was defeated by Senator Oman. Dr. Goff was formerly a member of the House and at one time headed the committee on Medicine and Surgery in that body. In King county "Dr." John Lydon, late president of the American "University" of Sanipractic, came in last in a field of three for the Senate. Lydon organized the recent and very unsuccessful sanipractic petition for a referendum. In the 42nd legislative district, E. Roger Dunham, chiropractor, placed sixth or seventh, apparently making but small impression on the voters during the campaign.

That the next House and Senate health committees will have medical representation is indicated in the returns which show that five physicians will probably serve at Olympia. Dr. Walter Taylor of Port Angeles was successful in his race for the Senate, while Drs. J. A. Durrant of Snohomish and Dr. A. F. Brockman of Bickleton ran strong in their districts. Drs. Warner Karshner and J. C. McCauley are holdover senators and they will certainly be present when the Senate is called to order in January.

FOR THE "TIRED BUSINESS MAN"

In all probability the Public Health League of Washington will soon begin a state-wide campaign against heart disease. Recommendation was made at the last convention by the retiring president, Dr. Frederick Epplen, that the organization should assume a new creative role in the fight against disease by centering a part of its activities in connection with heart ailments.

It is expected that the officers of the League will consider such a health project in the near future and outline plans for action. The educational feature of such a campaign will include talks by physicians before the various luncheon clubs of the state, accompanied by newspaper publicity and by the distribution of thousands of pamphlets issued under League auspices.

Heretofore the work of the League has been largely confined to child health activity. There has been no direct effort to reach the men and women of middle years with definite scientific information. It is believed that there is a very good field for service along the lines indicated in President Epplen's address.

MEDICAL RESERVE CORPS

The following changes of assignment status of members of the Reserve Corps are announced:

1st Lieut. Earl M. Anderson, Med-Res., Good Samaritan Hospital, Portland, Ore., assigned to 83rd Evacuation Hospital, 3rdArmy, as Medical Ward Officer.

1st Lieut. Meredith C. Beaver, Med-Res., University of rOegon Medical School, Portland, Ore., assigned to 83rd Evacuation Hospital, 3rd Army, as Laboratory Officer.

1st Lieut. Richard F. Berg, Med-Res., 80 W. Terry St., Portland, Ore., assigned to 82nd Evacuation Hospital, 3rd Army, as Surgical Ward Officer.

1st Lieut. Wilbur M. Bolton, Med-Res., St. Vincent's Hospital, Portland, Ore., assigned to 82nd Evacuation Hospital, 3rd Army, as Surgeon Ward Officer.

1st Lieut. Francis W. Brodie, Med-Res., Good Samaritan Hospital, Portland, Ore., assigned to 83rd Evacuation Hospital, 3rd Army, as Medical Ward Officer.

1st Lieut. Harold E. Dedman, Med-Res., 848 Stark St., Portland, Ore., assigned to General Hospital No. 46, Communications Zone, as Surgical Ward Officer.

1st Lieut. Harold E. Nichols, Med-Res., Seattle City Hospital, Seattle, Washington, relieved from assignment to 86th Evacuation Hospital, and reassigned to 84th Evacuation Hospital, 3rd Army, as Roentgenologist.

Col. James B. Eagleson, Med-Res., 902 Boren Ave., Seattle, Wash., relieved from assignment to General Hospital No. 50, Communications Zone.

Lieut. Col. Copeland Plummer, Med-Res., 817 Summit Ave., Seattle, Wash., relieved from assignment as Chief of Surgical Service, General Hospital No. 50, Communications Zone, and reassigned within the unit as Commanding Officer.

REPORTS OF SOCIETY MEETINGS

IDAHO STATE MEDICAL ASSOCIATION

PROCEEDINGS OF THE HOUSE OF DELEGATES OF THE THIRTY-FOURTH MEETING OF IDAHO STATE MEDICAL ASSOCIATION, SAND POINT, IDAHO, SEPTEMBER 4, 1926.

First Session

Sept. 1, 1 p. m.

Meeting called to order by the Chairman, Dr. N. R. Wallentine. Members present: A. Barclay, A. F. McClusky, W. F. Howard, C. W. Dill, G. H. Wahle, N. R. Wallentine, J. N. Davis.

In the absence of a quorum the Chairman appointed the following Committee on Resolutions and Necrology: W. F. Howard, of Pocatello; Alexander Barclay, of Coeur d'Alene; A. F. McClusky, of Buhl. Adjourned to meet Sept. 2 at 1:30 p. m.

SECOND SESSION

Sept. 2, 1:30 p. m.

Meeting called to order by the Chairman. Members present: N. R. Wallentine, O. F. Page, J. H. Einhouse, J. N. Alley, C. W. Dill, C. Wetherbee, E. N. Roberts, J. N. Davis, A. Barclay, W. F. Howard, G. H. Wahle, C. D. Weaver, A. F. McClusky.

Reading of the minutes of the 1925 session. Approved. Report of the Committee on the Revision of the Medical Fee Schedule. Dr. D. L. Alexander, Twin Falls. Report was made in detail on the conference of the committee with the Industrial Accident Board, Feb. 11, 1926. The proposed schedule was read as made to the Board, also the one as revised by said Board, copies of which were distributed. This report was made with the recommendation that the revised fee bill, as presented by the Board, be not accepted.

Regularly moved and seconded that the report of the committee be accepted and the committee be retained.

D. L. ALEXANDER
ALEXANDER BARCLAY
J. L. STEWART
A. A. CONNANT
Committee.

Further moved and seconded that the report of the committee with the fee bills in question be referred to the Resolutions Committee. So ordered. Adjourned meeting.

THIRD SESSION

Sept. 3, 1 p. m.

Members present: N. R. Wallentine, Alexander Barclay, C. W. Dill, W. F. Howard, E. E. Fry, C. Wetherbee, J. N. Davis, A. F. McClusky, C. D. Weaver, J. H. Einhouse, F. C. Gibson.

Report of the Secretary

(Summary)

Financial statement—		
Cash on hand Sept. 1, 1925	$ 357.46	
Total receipts Sept. 1, 1925 to Sept. 1, 1926	1,686.69	
Total expenditures Sept. 1, 1925 to Sept. 1, 1926		$1,485.78
Cash on hand Sept. 1, 1926		558.37
	$2,044.15	$2,044.15

Component Societies—

Total membership Sept. 1, 1926.....226

Twelve Component Societies as follows:

	Members
Bear Lake County	3
Bonner County	10
Canyon County	17
Idaho Falls	15
Kootenai County	8
Pocatello	35
Shoshone County	6
Southwestern Idaho	43
South Side	40
Tri-County	17
Nez Perce County	23
Upper Snake River	9

Respectfully submitted,
J. N. DAVIS, *Secretary.*

On motion the report was accepted and ordered placed on file.

Regularly moved and seconded that the Idaho State Medical Association set aside $50.00 each year to help defray the expenses of their Delegate to the American Medical Association. Carried.

Regularly moved and seconded that the special assessment levied by the House of Delegates at the 1925 meeting stand as made and that such amount of this assessment as is deemed necessary shall be attached to the notice of dues for 1927. Carried.

Amendment No. 3, to create the office of President-elect out of the office of Vice-President, which was made at the 1925 meeting, passed the House of Delegates by unanimous vote.

Report of the Resolutions Committee

BE IT RESOLVED BY THE HOUSE OF DELEGATES OF THE IDAHO STATE MEDICAL ASSOCIATION IN ANNUAL SESSION ASSEMBLED AT SAND POINT, IDAHO, SEPTEMBER 3, 1926

(1) That the Congress of the United States be and hereby is petitioned through our Senators and Congressmen to Repeal H. R. 7079 June 7, 1924, and that each of our Senators and Congressmen be furnished with a copy of this Resolution.

(2) Further that the Idaho State Medical Association endorses the report of the Committee on Medical Relief in Disaster adopted at the Dallas Session and recommends the organization of Medical Relief in disaster as outlined in the report.

(3) Further that the Idaho State Medical Association believes that all positions of trust pertaining to Public Health in any Community should be held by physicians and not by laymen holding D. P. H. degree and license, and that this association views with displeasure any action on the part of the Public Health Association which may consider replacing physicians as Health Officers by laymen with D. P. H. degree or license.

(4) Further that this Association approves of the passage of S. B. 3320 commonly known as the Federal Lye Bill and urges through our Senators and Congressmen its passage by Congress of the United States.

(5) Further that we oppose the further extension of the Sheppard-Towner Law and recommend unfavorable action on H. P. 7555 which provides Federal appropriation for same.

(6) Further that this Association is opposed to the passage of H. R. 11612 and S. 4085 identical in con-

tents, extending restriction and increasing records under the Harrison Narcotic Act.

(7) Further that the Idaho State Medical Association opposed H. R. 9055 an act to regulate the practice of Chiropractic in the District of Columbia, and that we urge through our Senators and Representatives its nonpassage by the Congress of the United States.

(8) Further that it has been called to the attention of your committee that some of our members have been in the habit of consulting with, and doing Radiographic work for Chiropractors, Naturopaths and other irregulars of the same ilk. We believe that this practice is not sound nor conducive to the dignity of our profession and we recommend the abolition of such practice.

(9) WHEREAS, At the invitation of the Industrial Accident Board, a Committee of Physicians met with a committee of Insurance Carriers at Boise on February 11, 1926, for the purpose of promulgating a physicians fee schedule which would be satisfactory to all parties concerned and which schedule was made after months of labor by these committees and when completed was submitted to the Industrial Accident Board for its approval, and

WHEREAS, Up to the present date, the receipt of this schedule has not been acknowledged by the Industrial Accident Board nor has the Board in any way conferred with these committees of Physicians and Insurance Carriers since February 11, 1926, and

WHEREAS, On September 1, 1926, the Industrial Accident Board has issued a fee schedule purported to be the result of "Public Hearings December 2, 1925, and February 11, 1926," but which in fact is nothing of the kind but rather is an arbitrary schedule of fees which are manifestly not the same as such charges as prevail in the same community for similar treatment of injured persons of like standard of living when such treatment is paid for by the injured person, and

WHEREAS, The Industrial Accident Board has absolutely ignored the wishes and desires of the Physicians and Insurance Carriers in this matter, now, therefore, be it

RESOLVED, By the Idaho State Medical Association, assembled Sept. 3, 1926, that our Association refuses to accept the schedule printed by the Industrial Accident Board, that said Board and all Insurance Carriers be notified to this effect, and further that copies of this resolution be mailed to every member of our profession in the State of Idaho. Be it further

RESOLVED, That we approve of the fee schedule as proposed by the Physicians and Insurance Carriers at the joint meeting of Feb. 11, 1926, and subsequently submitted to the Industrial Accident Board.

Signed
W. F. Howard
Alexander Barclay
A. F. McClusky
Committee.

Resolution No. 1 carried with the dissenting vote of three. Resolutions No. 2 to 9 inclusive were adopted as recommended by the Committee.

Signed
W. F. Howard
A. F. McClusky
A. Barclay

Meeting adjourned until Saturday, Sept. 4, at 1 p. m.

Fourth Session

Sept. 4, 1 p. m.

Report of the Tuberculosis Committee made by Dr. D. L. Alexander, Chairman, stating that the committee was well organized and in touch with the work of the Idaho Antituberculosis Association, the Department of Public Welfare and other organizations in the state seeking to further the welfare of the tuberculosis patient. The committee offered the following resolution:

WHEREAS, We believe that it will be to the best interests of the people of the State of Idaho that one tuberculosis hospital be established within the state, and

WHEREAS, We believe that a survey of the tuberculosis situation should be made in one or more counties of the state at the earliest opportunity, and

WHEREAS, The Idaho Tuberculosis Association through the aid of the National Tuberculosis Association is willing to undertake and complete such survey in order that statistics of a definite character may be compiled to present to the incoming legislature, and

WHEREAS, This is in line of the work of the Department of Public Welfare, now therefore, be it

RESOLVED, By the State Medical Association in session at Sand Point, September 2-4, 1926, that the Antituberculosis Committee of this society be instructed to send a request to Mr. David Burrell, Commissioner of Public Welfare of the State of Idaho, for such survey and that copy of such letter be sent to the Secretary of the Idaho State Antituberculosis Association.

Signed
D. L. Alexander, Twin Falls
E. N. Roberts, Pocatello
J. N. Allen, Lewiston
J. L. Stewart, Boise
E. E. Fry, Bonners Ferry.

Moved by Dr. Weaver, seconded by Dr. Gibson, the adoption of resolution offered by the Tuberculosis Committee. Carried.

Moved by Dr. Stackhouse, seconded by Dr. Barclay, the acceptance of the following resolution which refers to the recent fee schedule offered by the Industrial Accident Board. Carried.

WHEREAS, The Industrial Accident Board of the State of Idaho has recently issued a fee schedule and set of rules and regulations governing the conduct and setting the fees to be charged by Physicians doing Industrial Accident work in Idaho, and

WHEREAS, This fee schedule and rules and regulations has been gratuitously distributed throughout the state to physicians by the State Insurance Fund, through its manager Mr. W. Yager, with a letter of explanation stating that this is the schedule approved by the State Medical Association, which statement is absolutely false, and if this erroneous statement is not contradicted in no uncertain manner by the Idaho State Medical Association, it may be accepted as being the truth by a large number of physicians and others who are not conversant with the facts in the case, now, therefore, be it

RESOLVED, By the Idaho State Medical Association in session assembled at Sand Point, Idaho, September 2-4, 1926, that the Secretary of this Association be empowered and instructed to publish the fee schedule drawn up by the Committee of Physicians and Insurance Carriers Representatives on February 11, 1926, at Boise and subsequently submitted to the Industrial Accident Board for its approval.

This schedule to be in booklet form and to be distributed to every physician in the State of Idaho, and also to every Insurance Carrier doing business in Idaho, also copies to be sent to the Industrial Accident Board at Boise.

Moved by Dr. Alley, seconded by Dr. Barclay, the adoption of the following resolution which refers to the appointment of a full time Medical Referee on the Industrial Accident Board. Carried.

WHEREAS, At the present time the State of Idaho is engaged in a Workmen's Compensation Insurance business through its State Insurance Fund, and

WHEREAS, At the present time it has no regular physician as Medical Advisor, and

WHEREAS, In all well regulated Insurance Companies, their Medical Advisor is one of its most important officers, and

WHEREAS, During the past several years there has sprung up a great deal of friction and dissatisfaction between the physicians of the state and the management of the State Insurance Fund which in our opinion is due to the fact that medical problems in the management of the State Insurance Fund is being handled by laymen who are absolutely ignorant of and incapable of understanding or solving these problems, now, therefore, in the interest of harmony and better understanding between the physicians of Idaho and the management of the State Insurance Fund, be it

RESOLVED, By the Idaho State Medical Association, that we petition the State Insurance Fund, and the Governor of the State to employ a full time Competent Physician as Medical Examiner to handle that part of the State Insurance Fund business as falls peculiarly within the province of a medical man.

Signed

W. F. Howard
Alexander Barclay
A. F. McClusky,
Committee.

Resolution offered with reference to the fee paid for conducting insanity hearings. Moved by Dr. Barclay, seconded by Dr. McClusky, that the resolution be tabled. Later moved by Dr. Barclay, seconded by Dr. McClusky, that this resolution be removed from the table and certain objectionable material removed therefrom and presented for further consideration. Carried.

New resolution presented, regularly moved, seconded and adopted.

WHEREAS, The legal fee allowed physicians conducting insanity hearings in Probate Court proceedings is fixed by statute at $5.00 and considering the services of the physicians in these hearings it is our opinion that the fee is insufficient; now, therefore, be it

RESOLVED, That the statute governing the fees of physicians conducting insanity hearings in the Probate Court be amended to allow the physician $25.00 instead of the present fee of $5.00 and that the Legislative Committee take this matter up at the next session of the legislature with the proper authorities in whatever manner as seems best to them.

Signed by Committee.

The following "In Memoriam" resolution was passed:

WHEREAS, During the past year it has seemed wise in the providence of Almighty God to call to a higher service our esteemed brothers, G. S. Stockton; of Grangeville; F. P. Nourse, of Lewiston; Chas. S. Moody, of Rigby; Robert L. E. Newberne, of the U. S. Indian Service, and W. T. Seeley, of Kendrick, be it

RESOLVED, By the Idaho State Medical Association, in session at Sand Point, Idaho, this 2-4 of September, 1926, that we express our regrets for the loss of these our brothers and extend our sympathy to the loved ones left to mourn their loss, and be it further

RESOLVED, That a copy of this resolution be spread ou the minutes of this Association and also sent to each of the families of the departed brothers.

Signed by Committee.

Election of Officers

By nomination in regular form the following officers were elected.

President, D. L. Alexander, Twin Falls; President-Elect, Alexander Barclay, Coeur d'Alene; Secretary-Treasurer, J. N. Davis, Kimberly.

Councillor for East District: H. D. Spencer.

Committee ou Scientific Work: R. M. Bowell, Bonners Ferry; C. R. Scott, Twin Falls.

Committee on Public Policy and Legislation: R. M. Fouch, Chairman, Boise; H. P. Ross, Caldwell; F. M. Cole, Nampa.

Meeting place for 1927: Twin Falls.

Meeting place for 1928: Yellowstone National Park. Upon invitation of the State Associations of Wyoming and Montana to meet with them in the Yellowstone National Park in 1928 it was regularly moved and carried that we do so.

Moved and seconded by Dr. Fry and Dr. McClusky, that the then president and secretary act as members on the joint committee to arrange for the 1928 meeting as outlined above.

There were 48 registrants at the meeting, including 8 from Washington, 2 from California and one each from Oregon, British Columbia and Illinois.

Adjourned,

J. N. Davis, *Secretary.*

SCIENTIFIC PROGRAM

September 2

9 a. m.

"Cardiac Pain." Dr. G. F. Strong, Vancouver, B. C.

"Pediatrics in General Practice." Dr. F. B. Evans, Dover, Ida.

"Organization of the American Medical Association and the Functions of its Departments." Dr. John M. Dodson, Chicago, Ill.

"Practical Notes on the Treatment of Various Fractures." Dr. Mitchell Langworthy, Spokane, Wash.

The above program occupied the time until 4 p. m., when the Bonner County Medical Society treated the members and their ladies to a boat trip with dinner on the lake.

September 3

9 a. m.

"Goiter." Dr. J. C. Moore, Seattle, Wash.

"Surgery Versus X-Ray Treatment of Goiter." Dr. G. H. Wahle, Boise, Ida.

"Rheumatic Heart Disease." Dr. G. F. Strong, Vancouver, B. C.

"The Treatment of Pulmonary Abscesses." Dr. Emile Holman, San Francisco, Calif., Professor of Surgery, Stanford University, School of Medicine.

2 p. m.

"The Surgical Correction of Surgical Defects of the Face." Dr. Thos. Mullen, Pocatello, Ida.

"Principles of Surgery of the Large Intestines, Including the Upper Rectum. Dr. Robert C. Coffey, Portland, Ore.

"Bartholin's Glands, Skene's Glands and the Cervix as Focal Infections which Cause Rheumatism." Dr. Alfred Baker Spalding, San Francisco, Calif., Professor of Obstetrics and Gynecology, Stanford University School of Medicine.

6:30 p. m.

Official Banquet

President's Address. Dr. N. R. Wallentine, Sand Point, Ida.

"The Washington and Idaho Leagues." Dr. H. P. Marshall, Spokane, Wash.

"Northwest Medicine." Dr. Geo. A. Dowling, Seattle, Wash.

September 4

9 a. m.

"The Physician and His Patient." Dr. John T. Wood, Coeur d'Alene, Ida.

"Cardiovascular Renal Disease." Dr. Norman Keith, Rochester, Minn.

"Limitations of Cesarean Section." Dr. Alfred Baker Spalding, San Francisco, Calif.

"Results of Extract Treatment of Hay Fever in the Northwest." Dr. Robert F. E. Stier, Spokane, Wash.

1:30 p. m.

Business Meeting—

Report of the Idaho A. M. A. Delegate. Dr. Geo. R. Proctor, Nampa, Ida.

Report of the Secretary. Dr. J. N. Davis, Kimberly, Ida.

Report from the House of Delegates. "The Idaho State Medical Association here wishes to thank their guests and the Bonner County Medical Society for their major part in making this meeting a success."

2 p. m.

"The Colon—the Most Abused Organ of the Body." Dr. I. H. Moore, Seattle, Wash.

"Some Observations on the Ligation of Large Arteries." Dr. Emile Holman, San Francisco.

Meeting adjourned.

J. N. Davis, *Secretary.*

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., W. C. Woodward; Secty., O. H. Christoffersen

The General Meeting of the Society was held in Seattle, Sept. 13, in conjunction with that of the Medical Section, the first Monday in the month having been a holiday. Application for membership of Drs. C. A. Andresen, H. A. Schoffman, P. T. Scott and B. E. Washburn were read.

Miss Shaupleigh, a medical missionary working under the foreign board of the Friends' Church, gave a short talk about her activities in China. Her work is of an itinerant nature, traveling in a boat along the rivers of China, and administering to communities from time to time in a very helpful manner. A plea was made to the society for its support in this work.

SEATTLE ORTHOPEDIC SOCIETY

The annual clinics of the Seattle Orthopedic Society were held in the Assembly Room of the Medical and Dental Building, September 10, 11, with Dr. Willis of Tennessee, in charge. Attendance at these meet- Campbell, Professor of Orthopedics at the University ings was splendid and a well balanced series of cases were demonstrated.

The Friday morning clinic was on "Injuries to Back and Joints." Dr. Campbell described his method of arthoplasty and discussed the practibility of its value from an economic standpoint in working men. Friday evening he lectured to the King County Medical Society on posttraumatic conditions and illustrated his lecture with moving cartoons. These moving drawings demonstrate the operations and make the work much clearer than would ordinary movies, as all parts are distinct and there is no blocking of the field with blood, sponges or hands.

The Saturday morning clinic, which was on "Fractures and their Sequelae," was of very practical value to all who were in attendance.

The meetings were closed Saturday evening with a banquet at the Olympic Hotel and those who were present were given a treat in surprise entertainment. Dr. Campbell lectured on "Arthoplasty" and again used the moving cartoons for illustrative purposes. He has the ability to convey his ideas in a clear and concise way and the doctors who were fortunate enough to hear him all expressed their appreciation of the many benefits derived.

It is the policy of the Seattle Orthopedic Society to have only well-known men of ability in the orthopedic field conduct their annual clinics and to have the lectures on subjects of interest to all the profession. This fact, and because of the authority of the men who so kindly and willingly come to Seattle to conduct these meetings, have made a place for these clinics in the activities of the medical profession of the Northwest. Local attendance at the meetings was augmented by about seventy memoers of the profession from other cities.

WHITMAN COUNTY MEDICAL SOCIETY

Pres., D. T. Ford; Secty., F. E. Preucel

The Whitman County Medical Society met at Palouse, Wash., Sept. 20. There were present eighteen members of the society and eight visiting doctors, seven being from Spokane, and Dr. H. G. Willard of Tacoma, president of Washington State Medical Association.

Dr. Willard talked on "Ways and Means of Enlightenment of the General Public on the Progress of Scientific Medicine." An arrangement is being completed whereby the State Medical Association will cooperate with the county medical society in supplying able health educational speakers for schools, commercial clubs, churches and radio-broadcast talks.

There was also an instructive scientific program led by Drs. Gilleland, of Pullman; Mitchell of Colfax, and E. K. Wolfe of Palouse. The visiting doctors participated in the discussion.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., J. T. Dowling; Secty., M. J. Morris

The monthly meeting of the Puget Sound Academy of Ophthalmology and Oto-Laryngology was held at the Virginia Mason Hospital, Seattle, Sept. 21. The meeting was called to order by the President at 8:30 p. m. The minutes of the last meeting were read and approved.

Dr. McCoy presented a case of Cholesterin Crystals in the Vitreous. There were a few crystals in the left eye and many in the right. With the right eye, the patient complains of seeing the typical snow-storm. This condition has been present for several years, but has been much worse the last few months, and is caused by change in hemoglobin of the blood. It is an incurable condition. These crystals are seen in other parts of the body.

Dr. Chase presented two cases of Tuberculosis of the Larynx. Both of these patients applied direct sunlight through the mouth to the larynx. The method was demonstrated.

Dr. Morris presented a case of Sarcoma of Choroid of the left eye. The tumor has been present for about six months but is still intraocular. For this reason the prognosis is quite favorable.

The paper of the evening was read by Dr. L. L. McCoy on "Preoperative and Postoperative Treatment of Cataract." He gave minute details of the care of cataract cases before and after operation. This is of vital importance in the outcome of the operation and was quite ably covered in the paper. The paper was freely discussed by members present.

Dr. J. J. Johnson, Tacoma, reported the Fourth Annual Post-Graduate Course of Ophthalmology and Oto-Laryngology at Denver, July 12 to 24. Fifty dollars was charged for the course which was given under auspices of State Society of Ophthalmology and Oto-Laryngology.

"Round Table" discussion was held at lunch. Fifty to sixty men were present from eighteen states and Canada. Ten groups were formed for demonstrations, held between 8 and 10 a. m. 10 to 12 a. m. general assembly and lectures. Lectures to 4 p. m., sometimes to 5 and 5:30. Many interesting papers were read, one by Dr. Harter of the Society, on Facio-Maxillary Surgery.

Among the instructors in Ophthalmology were Drs. Holloway, Philadelphia; Vanderheit, Chicago; Tronsesco, New York; Jackson and Finnhof, Denver.

The laryngologists included Drs. Kospeski, New York; Prentice, anatomist from University of Iowa, and Levy, Denver.

BOOK REVIEWS

Edited by **KENELM WINSLOW, M.D.**

The Human Cerebrospinal Fluid. Association For Research In Nervous And Mental Diseases. A Series of Research Publications. Vol. IV. Cloth, 568 pp. $10. Paul B. Hoeber, Inc., New York. 1926.

This is a very elaborate and exhaustive symposium on the subject by some thirty-nine contributors. The various monographs more than cover the topic, since they unavoidably overlap in treating many times the same phase of the theme. This is in one way an advantage in giving different points of view, interpretations and research results and in another a disadvantage in the lack of consecutive, concise, logical statement.

The work begins with a description of the fons et origo of the cerebrospinal fluid in the chorioid plexuses of the cerebral ventricles and its passage through the various foramina in the brain into the subarachnoid spaces. Accessory sources of supply are thought to reside in the canicular system surrounding the cells and blood vessels of the brain. Circulation of the cerebrospinal fluid through the central nervous system undoubtedly occurs but the causes of this movement are somewhat obscure. Pulsation of the brain and other agencies, as osmotic and specific gravity effects, may induce a current in the cerebrospinal fluid and experiments have shown conclusively that dyes introduced either in the ventricles or lumbar subarachnoid space may be recovered in the cerebrospinal fluid at the opposite end of the cerebrospinal system. Absorption of the cerebrospinal fluid takes place into the blood, chiefly through the arachnoid villi into the great dural sinuses by filtration, osmosis and diffusion. By increasing the salt content of the blood by intravenous hypertonic saline injections, absorption of the cerebrospinal fluid is greatly augmented by way of the perivascular channels and ependymal lining of the ventricles and so into the capillaries.

The monograph dealing with the examination of the spinal fluid taken at different levels has great value, including the discussion of the increased protein content and yellow staining of the fluid (xanthochromia) below a tumor compressing the cord. There are chapters concerning very elaborate investigations into the protein, sugar and chloride content of the cerebrospinal fluid. It is shown that a spinal fluid sugar content below 30 mg. is nearly always indicative of an acute meningitis, in the absence of a hypoglycemia. A low chloride spinal fluid content accompanies a high protein content below compression tumors of the spinal cord. There is a most painstaking study of three colloidal tests of the cerebrospinal fluid, showing that the colloidal gold test is of value in nonsyphilitic meningitides and is a diagnostic aid in multiple sclerosis.

Important chapters are devoted to pressure in the cerebrospinal fluid, to diagnosis of cerebral and spinal cord tumors, to ventriculography, and to the use of lipiodol in tumors of the cord. Following these are chapters on the cerebrospinal fluid in various diseases of the brain and cord, comprising more than a third of the volume. The book concludes with sections on treatment of disorders by the injection of serum and drugs into the cerebrospinal fluid.

The bibliography is immense, probably including all of importance in the literature of the subject. Discussions by leading neurologists and neurologic surgeons follow the presentation of each paper and are among the most valuable contributions. Considered as a whole this collection of monographs constitutes the most complete survey of the subject in English and will prove invaluable as a reference book.

WINSLOW.

PLASTIC SURGERY OF THE HEAD, FACE AND NECK. By H. Lyons Hunt, M. D., L. R. C. S. (Edin.) Consulting Plastic Surgeon, Midtown Hospital, New York City, etc. 404 pp. $7.00. Illustrated with 342 Engravings and 10 Colored Plates. Lea & Febiger, Philadelphia and New York, 1926.

An historical review is given in detail and is most interesting. There is a chapter on protheses; one on local anesthesia in operations upon the head, face and neck; and one on physiotherapy in superficial surgery of the face. The anatomic charts and descriptions given at the beginning of sections are well done and instructive. The photographs and diagrams are clear and easily understood. A bibliography is appended to each chapter, covering the literature from 1919 to the present date, the reader being referred to the text of Dr. J. S. Davis for bibliography to 1919.

This book convinces one that the author is an ingenious surgeon. In most problems he gives, first, the views and methods of other men and finally incorporates the results of his own experience, as for example the use of turtle bile powder on wounds. This incorporation of the author's experience makes the book worth reading for anyone seeking information in this field. A firm stand is taken against the injection of paraffin. He states, "it is curious that a day and age, that can promulgate the thousand and one regulations for the prevention of the suffering of dumb creatures, can view with apparent equanimity physical outrages against mere humans. Against such an outrage as the injection of paraffin into the human face, no voice seems to be raised in even mild disapproval. The sooner legislation can be brought to bear upon this real and common danger the better for the community at large."

The chapter on rhinoplasty is not complete. In fact, it could not be in the space allotted. Some of the new operative procedures are described by words without diagrams. This method is not good, as words often paint an obscure and ambiguous picture.

HARTER.

THE DUODENAL TUBE AND ITS POSSIBILITIES. By Max Einhorn, M. D. Professor of Medicine at the New York Post-Graduate Medical School, Visiting Physician to the Lennox Hill Hospital, New York. Second Edition, Revised and Enlarged. Illustrated, Cloth. 206 pp. F. A. Davis Co. Philadelphia, 1926.

The use of Einhorn's duodenal bucket, thread and tube, with many other ingenious and original instrumental contrivances for exploring the digestive canal and improving our knowledge of gastroenterologic diagnosis, are already well known from his numerous valuable contributions to medical literature during a long and distinguished life. All these brochures have been gathered together in this book and, while some have not much practical value at present, they are not without historic interest.

The diagnostic worth of gastric analysis was formerly greatly overrated by gastrologists, who in some cases became veritable ass-trologists, in placing too much import on their findings in foretelling events. Then came the x-ray, which has thrown more light on the darkness and vagueness of digestive disorders than gastric analysis ever did. So much so that even fairly good practitioners rely upon it in diagnosis of gastric disorders to the exclusion of gastric analysis, which is unwise. Duodenal analysis is infinitely more complicated and uncertain than gastric. There are no standardized and universally accepted findings in duodenal analysis characteristic of the more common diseases of the upper digestive tract, liver and pancreas, known to the reviewer.

Here, again, the x-ray has come to the rescue in revealing the presence or absence of gallbladder shadow, after use of the dye, and is thus infinitely superior in diagnostic value to analysis of all the contents ever withdrawn from the duodenum by bucket or tube with respect to gallbladder disease. And it is with regard to cholecystic diagnosis that Einhorn places most value on his findings in duodenal analysis.

His familiarity with the duodenal contents makes Einhorn a worthy adversary of Lyon. As is well known, Einhorn had repudiated all the findings of the A, B, C, and other unlettered bile, by showing that typical dark bile from the gallbladder (supposedly) is gotten from the duodenum by the Lyon-Melzer method in the presence of an occluded cystic duct. This falls in with Dunn's brilliant work, reported at Spokane a few years ago, in proving that this specific gallbladder bile could also be obtained from the duodenum after the removal of the gallbladder. It is true that Lyon replies to this in his book by affirming that the dilated common duct takes the place of the resected gallbladder, but this requires a greater stretching of the imagination than of the common duct. Much stress has also been put on bacteria in duodenal contents as evidence of cholecystic disease, but at operation the contents of the diseased gallbladder are often sterile.

It seems to the reviewer that Einhorn is "hoist with his own petard" and that his argument against Lyon may be used with like force against himself. The duodenal contents significant of gallbladder disease, according to Einhorn, contain not the normal clear yellow bile but dark, turbid bile, containing often cholesterin crystals and pus. Einhorn affirms that the dark supposedly gallbladder bile of Lyon is due to stimulation of the liver by magnesium sulphate and is in fact liver bile, in contradiction to gallbladder bile. But in several of Einhorn's patients who came to operation the cystic duct was found occluded and yet he had made a diagnosis of gallbladder trouble from the pathologic duodenal contents characteristic of cholecystitis. In other words, his findings must also have represented only bile from the liver when the cystic duct was not patent.

The indications for duodenal feeding and therapeputics are discussed. Various innovations have rendered duodenal feeding less important than formerly, as glucose intravenously. The author concludes the little book with the description of several other instruments for exploring the digestive canal which are exceedingly ingenious but have a very limited application. WINSLOW.

INTESTINAL TUBERCULOSIS. Its Importance, Diagnosis, and Treatment. A Study of the Secondary Ulcerative Type. By Lawrason Brown, M. D., and Homer L. Sampson, Chairman and Roentgenographer of the Trudeau Sanatorium, Saranac Lake, New York. Illustrated, 112 Engravings. Cloth, 304 pp. $4.00. Lea & Febiger, Philadelphia and New York, 1926.

This is the first volume of a small series representing the unique work of the Trudeau Sanatorium and the fruition of one of Trudeau's ideals. To all those who have read his remarkable autobiography perhaps the chief impression conveyed by its inspiring pages was his professional enthusiasm and desire to add to our knowledge of pulmonary tuberculosis, and this is the outcome of one of his most cherished projects. While intestinal ulcerative tuberculosis may arise by way of the blood, lymph or direct extension, it occurs most often by contact with swallowed tubercle bacilli. Enormous numbers of bacilli are ingested and often make their way through the intact mucous membrane of the bowels without causing ulceration, so that there must be some unknown predisposing cause, probably a catarrhal condition, which favors implantation of the bacilli. The ileocecal region is the most common site of intestinal tuberculosis, but the large bowel is very frequently involved. Primary intestinal tuberculosis occurs in about seven per cent of adult cases, the balance being secondary to pulmonary lesions.

The symptomatology of early intestinal tuberculosis is uncertain, as digestive disturbances, constipation alternating with diarrhea, local tenderness, leukocytosis due to ulceration, etc., so that a certain diagnosis may only be made with the x-ray. Hypermotility and consequent filling defects are most commonly seen pathologic conditions in the section of bowel affected with tuberculous ulceration. A spasm of the cecum and ascending colon, while all other parts of the colon are filled, is also suggestive of tuberculosis, especially if the cecum or ascending colon repeatedly fills and empties, also absence of haustration.

The various complications of intestinal tuberculosis are discussed, such as perforation, hemmorhage, etc. Three cases of perforation were observed by the authors. The reviewer has seen one fatal case of perforation of a tuberculous colon, in which there was no lesion in the lung at autopsy, except a caseous nodule at one apex the size of a bean. The writers are quite enthusiastic over the ultraviolet ray treatment of intestinal tuberculosis and record many cures thereby, even when the patient ultimately died of pulmonary lesions. They note the danger of the patient going asleep when giving himself the light therapy, and advise the use of the alarm clock to avoid this occurrence. One severe burn had happened from this cause in their experience. Medical and surgical treatment are discussed in detail.

From 50 to 80 per cent of all persons dying of pulmonary tuberculosis have also intestinal tuberculosis, so that it is by far the most common complication of phthisis. This work is the most complete and authoritative book that has appeared on the subject and is, therefore, highly to be commended. The arrangement of the text is concise, and there are excellent summaries of all topics considered, with an admirable bibliography appended. WINSLOW.

SURGERY OF NEOPLASTIC DISEASES by Electrothermic Methods. By George A. Wyeth, M. D., New York, Preface by Howard A. Kelly, M. D., Baltimore. With 137 Illustrations, 298 pp. $7.50. Paul B. Hoeber, Inc. New York, 1926.

The author is one of the leading authorities in this country in the electrothermic removal of neoplasms. He is responsible for the term endothermy applied to the technic hitherto designated as surgical diathermy. He divides endothermy into three groups, monopolar endothermy, bipolar endothermy and the endotherm knife. The monoplar method, known as desiccation, in which the current is taken from the Oudin terminal, is utilized for the removal of superficial growths such as moles, warts and epitheliomata. The bipolar method, also termed electrocoagulation, refers to the use of the D'Arsonval current, employed to remove deep-seated malignancies as of the tongue, mouth, bladder, vagina and rectum. The endotherm knife, which is a cambric needle attached to a suitable holder, employs a powerful, undamped current, generated by the addition of radio tubes to the high frequency apparatus. This knife is employed in excising extensive malignant growths, as of the breast or other parts of the body. Operations by any of these methods are bloodless, without infection and heal with little or no scar formation. The author dilates at length on the advantages of these methods of removing available malignancies over the use of the knife, x-ray and radium. The tumor is removed entirely at one sitting, limited as the operator desires, with no possible metastases, since blood vessels and lymphatics are sealed by the operation. Numerous cases are cited, the results of which are amplified by illustrations showing successful results after periods of years. Any

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one interested in this line of work will find profitable reading in this volume which offers the latest, up-to-date information regarding this line of surgical practice.

PATHOLOGY AND TREATMENT OF THE INFLAMMATORY DISEASES OF THE NASAL ACCESSORY SINUSES. By Professor Dr. M. Hajek, Chief of the Laryngo-Rhino-Otological Clinic, University of Vienna. Translated and Edited by Joseph D. Heitger, M. D., Louisville, Kentucky, and French K. Hansel, M. D., M. S., St. Louis, Missouri. Fifth Edition, Completely Revised and Enlarged. 2 Volumes. 702 pp. Cloth, $17.00. Illustrated with Cuts and Photographic Plates. The C. V. Mosby Co., St. Louis, 1926.

Rhinologists the world over have for years been familiar with the work of this author. No material published on the subject of the sinuses but contains repeated reference to his investigations. He did much of the pioneer work in this field before these cavities were recognized as the seat of so much pathologic change. This first American edition is a translation of the fifth German edition which is the first revision since the war.

During the period since the last German edition the principal advance has been made in radiographic diagnosis which feature has been revised to embody the latest technic. Hajek rightly states, however, that the rhinologist should follow his own judgment and should not submit to the dictates of the roentgenologist. Additions have been made to the chapters in the matter of pathology, principally microscopic. With these exceptions there has been little change from the earlier editions, as the original work was based on clinical case reports supported by pathologic findings, a solid foundation which time does not change.

The reader not only has the benefit of the author's vast experience but through frequent references to other authors he also has access to the best medical thought on the subject. A complete bibliography containing over 900 titles covering these references is appended. This work has long since earned its place in medical literature and the American translation is bound to be a tremendous success. BRUGMAN.

THE TREATMENT OF FRACTURES. With Notes Upon A Few Common Dislocations. By Charles L. Scudder, M. D., Consulting Surgeon to the Mass. General Hospital. formerly Assistant Professor of Surgery at the Harvard Medical School. Tenth Edition, Revised. Octavo Volume of 1240 pages, with 2027 Illustrations. Philadelphia and London: W. B. Saunders Company, 1926. Polished Buckrum, $12.00 net.

This is the tenth edition of Scudder's well-known work on fractures and dislocations, the first edition of which appeared in 1900. It has now grown into maturity to the impressive size of twelve hundred pages with two thousand illustrations. Several chapters have been rewritten, but a considerable portion of the increase in size is due to the addition of six new chapters by writers other than the author.

This volume now contains descriptions of all methods which may be regarded as accepted in the treatment of fractures and credit is freely given to the originators of methods. Than this, it may safely be said, there is no better work on the subject of fractures in the English language. MURRAY.

PRACTICAL DIETETICS for Adults and Children in Health and Disease By Sanford Blum, A. B., M. S., M. D., Head of Department of Pediatrics, and Director of the Research Laboratory, San Francisco Polyclinic and Postgraduate School. Second Revised Edition. 362 pp. $4.00. F. A. Davis Company, Philadelphia, 1926.

The author states that physicians ordinarily give only general directions as to diet to the individual patient on account of the time required for the preparation of details. The dietaries in this volume will help to relieve this situation. Beside being accurate from a medical standpoint, a dietary should be such that the patient can and will follow it. The first part of the book is devoted to dietary for adults in health and disease. Diseases are arranged alphabetically. Under each are listed articles of food the patient may eat and must avoid, followed by type meals. One-third of the book contains dietaries for infants and children in health and disease, the diets varying as the infant increases in age. There are also detailed descriptions of diet procedures in connection with roentgenologic examinations and the technic of nutrient enemata. As the average physician is deficient in practical knowledge of diets, this volume will serve as a useful and ready reference handbook.

HAY-FEVER AND ASTHMA. A Practical Handbook for Hay-Fever and Asthma Patients. By Ray M. Balyeat, A. M., M. D. Instructor in Medicine in the University of Oklahoma Medical School, etc. With 27 Illustrations. 198 pp. $2.00. F. A. Davis Co., Philadelphia, 1926.

This booklet offers the application of the principles of treatment of Chandler Walker and Koch in a local community. The author has comprehensively stated the salient facts which should be in the hands of the sufferer of hay-fever and asthma. The distinct line which has been drawn in this lay educational effort between the facts which the physician should know and those which the patient should know is worthy of comment. The author stresses the importance of pollens being wind-blown before they can cause hay-fever. Plants like the goldenrod, which many have felt to be the cause of hay-fever, must give way to the more insignificant and less obvious grasses, the pollen of the latter being readily carried by the wind, while that of the former is heavy and is carried on the feet of insects. This work demonstrates the need of men in different localities of the country working out the flora of their particular locality, and basing treatment upon pollen extracts made from local pollens. The patient surely must find this publication a source of considerable helpful and satisfying information. HOFRICHTER.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington, Idaho, Montana and Pacific Northwest Medical Association

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ORIGINAL CONTRIBUTIONS

LYMPHOBLASTOMA*

GEORGE W. HOLMES, M.D.
BOSTON, MASS.
Department of Roentgenology, Massachusetts General Hospital

The use of a distinctive classification, based on the pathologic findings, in describing malignant processes arising in lymphoid tissues, has resulted in a great variety of names for a condition, the clinical picture of which varies but little.

In the more recent literature, especially, there has been an attempt to avoid sharp distinctions, and the term lymphoblastoma, suggested by Mallory, has been rather generally used to include the entire group. This acceptance of a general term for a group of conditions which may be different manifestations of the same pathologic process has helped to simplify the clinical picture.

In this paper lymphoblastoma is used to include such terms as lymphosarcoma, aleukemia, lymphatic leukemia, Hodgkin's disease (lymphogranuloma), and malignant lymphoma. Considered in this way, lymphoblastoma is a disease of much greater clinical importance than is generally supposed, presenting a wide range of symptoms and involving at times nearly every organ of the body. Glandular enlargement may be local or general, or it may be entirely absent. The presenting symptoms usually arise in those organs which happen to be the seat of the disease. The diagnosis is often difficult as the following case illustrates:

Case No. 64614. A man, aged 47, was admitted to the Massachusetts General Hospital for study because of continued temperature, enlarged liver and albumin in the urine. The appendix had been removed eighteen years previously, otherwise his past history was negative.

The present symptoms began five weeks before entry. There was a feeling of weakness and he tired easily. Two weeks later he began to have severe, sharp, shooting pains in the middle of the back, occurring at night, for which he consulted his family physician who found his condition as stated, and referred him to the hospital.

At the time of admission he had a dry cough, and the eyes were red and tender. Photophobia was present. He stated that the right eye was involved five days after the left, and that the trouble in the eyes followed a cold.

The examination showed blepharitis, conjunctivitis and a yellowish discharge from both eyes. The nasal septum was perforated posteriorly, and there was a small necrotic area on the hard palate near the right molar tooth. The cervical, axillary and inguinal glands were palpable. The diaphragm was high on the right side, otherwise the examination of the chest was negative. The liver was felt 5.5 cm. below the costal margins. There was a hernia in the scar at the site of the previous operation. The spleen was not felt and there was no evidence of fluid in the abdomen.

An examination of the blood showed the hemoglobin to be 70 per cent and the white count 4,400. Repeated examinations during an interval of two weeks showed a considerable variation in the number of white cells, the highest count being 9,200 and the average around 6,000. The smear showed polynuclears 50 per cent; lympocytes 47 per cent; mononulcears 2 per cent; eosinophilic 1 per cent. An examination of the sputum showed no tubercle

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* Read before the Fifth Annual Meeting of Pacific Northwest Medical Association, Spokane, Wash., July 1-3, 1926.

bacilli. There was no evidence of blood in the stools. The Wassermann, both with blood and spinal fluid was negative. An x-ray examination of the chest, gastrointestinal tract and lumbar spine was negative. A surgical consultant did not think the symptoms sufficient to warrant an exploratory operation. Antileutic treatment (mercury and K. I.) was given and there followed some general improvement.

The eye trouble continued and he was transferred to the Eye and Ear Infirmary for further treatment, where he remained three months. While there his left eye was enucleated and an abscess in the right eye was drained. The diagnosis made by the pathologist from the tissue of the left eye was malignant lymphoma. Three days before returning to the General Hospital he had a severe attack of abdominal pain and his temperature rose to 104°. He was irrational and at times unconscious. A surgical consultant considered him too sick for operation. He grew rapidly worse and died.

The diagnosis made at necropsy was malignant lymphoma (lymphosarcoma), involving right kidney, adrenal, and a portion of the liver; lymphocytic infiltration of left kidney, myocardium and stomach; perforating ulcers of the stomach; generalized acute peritonitis; small hydrocele; and chronic peritonitis.

Dr. Richardson, who performed the autopsy, was of the opinion that the initial lesion was in the right adrenal. There was, however, a large tumor (20x10 cm.) lying between the lower border of the liver and the right kidney, with extension into both organs, as well as the heart and stomach.

If mistakes of this kind are to be avoided, the possible manifestations of this disease should be kept constantly in mind. The most common source of error is the failure to consider lymphoblastoma as a possible cause of the patient's symptoms. An early and correct diagnosis in these cases is of the greatest importance, as upon it depends not only the institution of proper treatment, but to a considerable extent the prognosis.

Minot and Isaacs, in a recent analysis of the complete records of 477 cases of lymphoblastoma, 401 of which were known to be dead, found the average duration of life to be 2.76 years. Ten and three-tenths per cent of this group, however, lived six years or more. When the group was taken as a whole, there was little evidence that life had been prolonged by any form of treatment, although in certain cases, where an early diagnosis was made and proper treatment started, there was evidence of prolongation of life and even possibility of cure. They deplore the failure to make an early diagnosis in a large percentage of cases.

The disease occurs more often in males than in females, and in early adult life more often than in childhood or old age, but it may occur at any period, the youngest in this group being four years of age and the oldest eighty-four.

The symptoms and physical findings will depend to a considerable extent upon the organs involved and the stage of the disease. An elevated temperature is a not uncommon, early finding. A feeling of weakness and tendency to tire easily is frequently complained of; often there is a troublesome cough. Pain is often severe and may be associated with the part involved. Itching is a common complaint. Abdominal symptoms occurred early in 25 per cent of the cases observed by Minot and Isaacs. Perhaps the most frequent physical finding is enlargement of the peripheral glands, but it is not always present. Signs in the chest are usually absent, although the x-ray frequently shows an enlargement of the mediastinal glands, particularly the peritracheal group.

Masses are sometimes felt in the abdomen, and occasionally the examination of the gastrointestinal tract will show a deformity of the stomach, small bowel or colon that resembles carcinoma. Jaundice may be present, and it is often accompanied by pain in the right upper quadrant. Of the 119 cases with abdominal symptoms reported by Minot and Isaacs, 40 per cent had been operated upon for some abdominal lesion other than the correct one. Hematuria occurs when the kidney is involved, and the accompanying pain may resemble that of renal colic. The motor reflexes may be disturbed as a result of involvement of the spinal cord or brain. Tumors may appear in the orbit, and lead to destruction of the eyeball, if proper treatment is not promptly given.

The examination of the blood shows a variation from the normal in the white count and in the stained smear, but frequently their findings are not conclusive. The diagnosis is usually made by biopsy. This valuable procedure is often neglected.

In our cases the x-ray examination has been of greatest value, when the lungs or mediastinal glands were involved. When the lesion was in the gastrointestinal tract, the x-rays have usually demonstrated it, but the findings have been incorrectly interpreted. With involvement of bones, the roentgen findings are more characteristic. We have not had an opportunity to examine the urinary tract in a proved case, but it is probable that pyelograms would show evidence of the lesion. In none of the cases, showing involvement of the nervous system, was a lesion demonstrated by x-rays.

The findings in the chest may be due to involvement of the mediastinal glands alone, or there may be an accompanying involvement of lungs or pleura or both. Jaches and Wessler have called attention to the frequency with which this disease attacks the

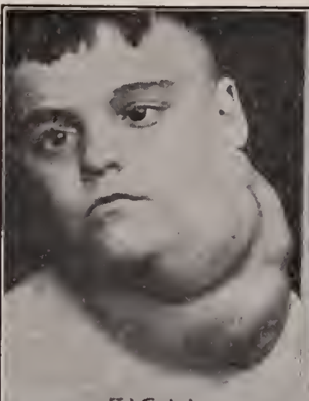
FIG. 1-A

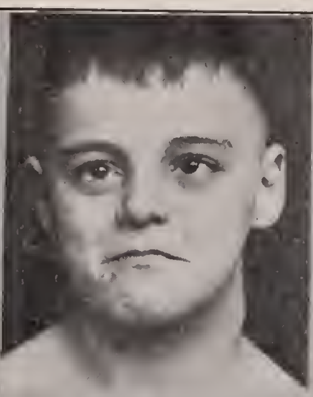
FIG. 1-B

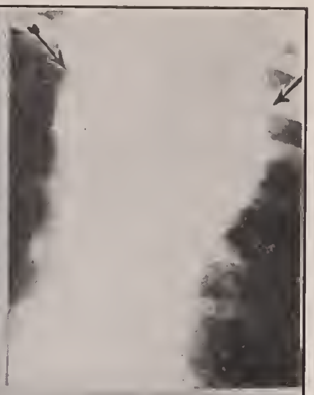
FIG. 2-A

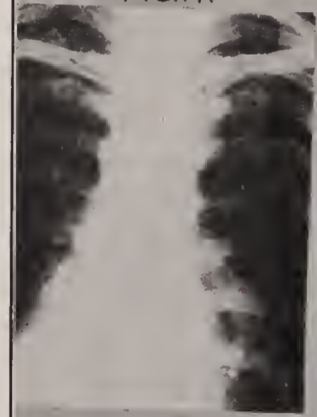
FIG. 2-B

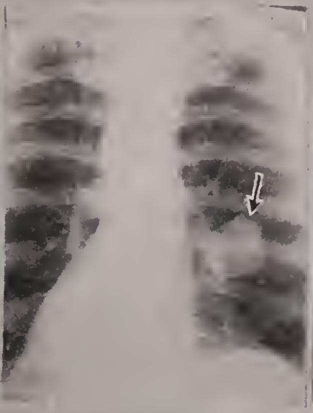
FIG. 3-A

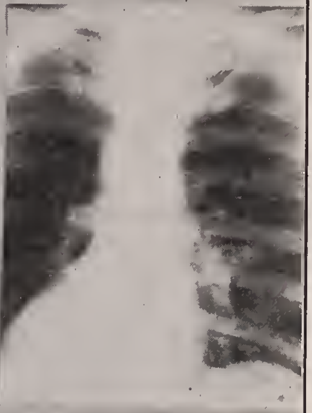
FIG. 3-B

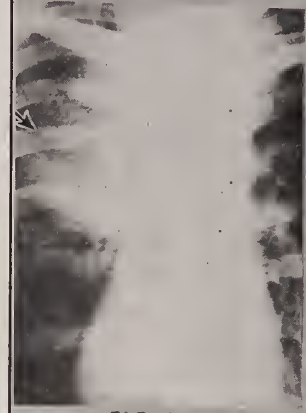
FIG. 4

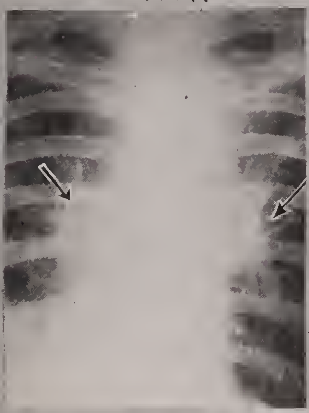
FIG. 5

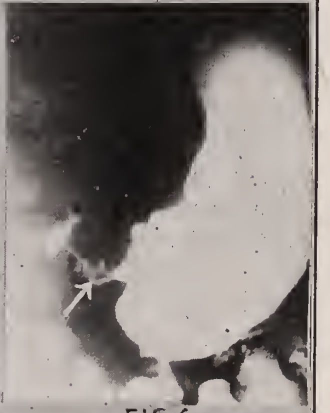
FIG. 6

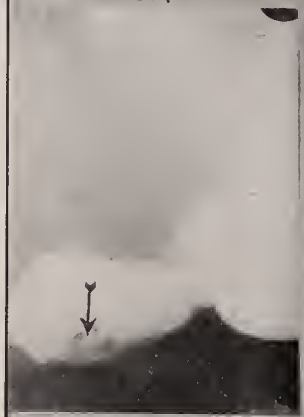
FIG. 7

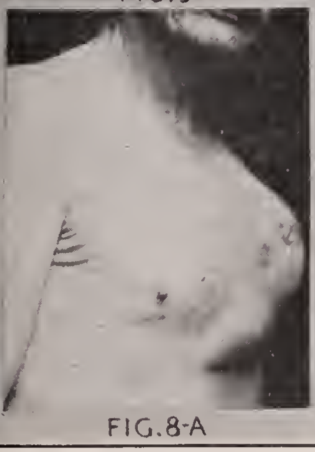
FIG. 8-A

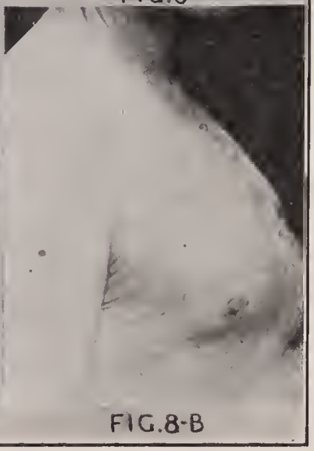
FIG. 8-B

Fig. 1 A—Large Lymphoblastoma of the Hodgkin's type, involving the glands in the neck.

Fig. 1 B—The same case after treatment with short wave x-ray.

Fig. 2 A—Lymphoblastoma of the mediastinum. The peritracheal glands are involved, presenting the characteristic picture.

Fig. 2 B—Same case after treatment with short wave x-ray.

Fig. 3 A—Lymphoblastoma of the lungs of the nodular type. The sharply localized area of increased density in the right lung suggests the appearance seen in metastasis from other tumors.

Fig. 3 B—The same case after treatment with short wave x-ray.

Fig. 4—Lymphoblastoma of the infiltrating type. Note the radiating line extending outward into the left lung field.

Fig. 5—Lymphoblastoma involving the pleura and glands about the hilus.

Fig. 6—Lymphoblastoma of the stomach. Note the annular ragged filling defect of the antrum, of the type usually seen in carcinoma.

Fig. 7—Lymphoblastoma involving the jejunum. Note the mottled appearance of the small bowel at the point indicated by the arrow.

Fig. 8 A—Lymphoblastoma of the sternum.

Fig. 8 B—Same patient after treatment with short wave x-ray.

peritracheal glands, and state that when this group is enlarged in an adult the most probable cause is some form of lymphoma. We have found it to be a valuable diagnostic sign.

The enlargement usually shows as a lobulated shadow of about the same density as the aorta, occupying the upper mediastinum. The margins of the shadows are usually sharply defined, but there may be infiltration of the surrounding lung. Pulsation is absent as a rule. The shadow of this tumor can often be separated from that of the aorta. It generally is visible both to the right and to the left of the mid shadow, and rarely extends below the hilus regions, in this way differing from mediastinal abscess, with which it is sometimes confused. The respiratory movements of the diaphragm are not limited unless the process involves the pleura, or the tumor is unusually large. Changes in the pleura with the accumulation of fluid are usually a late manifestation of this disease. With carcinoma, on the contrary, pleural involvement is usually early. Carcinoma causes limitation of respiratory movements, either from invasion of the pleura or by occlusion of a bronchus, at a much earlier stage of the disease than does lymphoblastoma. Clinically the disease most often confused with lymphoblastoma of the thorax is tuberculosis. The x-ray examination generally leaves no doubt as to the diagnosis, but in rare cases the appearance in the lungs may simulate a generalized tuberculosis and a positive diagnosis may be impossible. Perhaps the most common cause of error in x-ray interpretation is aneurysm. Aneurysms may or may not pulsate, they are rarely bilateral or lobulated, and evidence of infiltration is absent. The clinical and laboratory findings are usually conclusive, but in some cases it may be necessary to resort to the therapeutic test.

In the gastrointestinal tract the roentgen findings are those of carcinoma, with the exceptions that the lesions are frequently multiple, and are not uncommon in the duodenum and other parts of the small bowel. The clinical symptoms are more often those of ulcer than of cancer. Unless the patient is known to be suffering from lymphoblastoma, the findings are usually misinterpreted. In six cases recently reported from our clinic, the interpretations were wrong in all but one, and this patient was being treated for lymphoblastoma. Only a small number of cases with gastric or abdominal symptoms had complete x-ray study; the correct diagnosis was generally not made until necropsy. During life the symptoms were attributed to other causes; probably irradiation was too often thought to be the cause of the gastric symptoms.

In regards to the gastrointestinal tract, the conclusions to be drawn from a study of our material and a review of the literature are: first, that lymphoblastoma involves the gastrointestinal tract with greater frequency than is generally supposed; second, that it may be the seat of the primary lesion; third, the roentgen examination is of value in locating the lesion and may determine its nature.

It is not uncommon to find involvement of the osseous system. The bone most often involved is the sternum. Other bones attacked are the ribs, skull and vertebra. There are four cases showing involvement of the sternum that have been studied in our clinic. We have not seen involvement in other bones, although several are reported in literature. Like all tumors of central origin, lymphoblastoma occurs in cancellous bone. It is usually a single lesion; frequently there is an accompanying glandular involvement. On the roentgenograms the appearance differs but little from that of other malignant tumors of central origin. There is extensive, irregular destruction of bone with little, if any, attempt at repair. Extension through the bone with involvement of the surrounding soft tissues occurs early. In some of our cases the tumors were quite soft and from their location were suggestive of aneurysm. By taking films in the direct lateral view it was usually possible to demonstrate a clear space between the shadow of the aorta and that of the sternum. This would, of course, not be possible with an aneurysm which had eroded the sternum. In one case the mass in the sternum was continuous with the shadow of enlarged glands in the mediastinum, and may have been a direct extension from these glands.

Treatment. The form of treatment employed should depend upon the stage and type of the disease, and in most cases must be largely palliative. There is very little evidence that life has been prolonged by any method of treatment, and in advanced or acute cases, radical or vigorous treatment may even hasten the progress to a fatal termination. A comparison of a large group of treated cases with a similar group of untreated cases shows very little difference in the duration of life. If, however, we take only the early cases there is some evidence that the course of the disease has been influenced by treatment. This is particularly true of those cases with a localized lesion, in which surgical removal was complete. Bunting and Yates have reported cases of this type apparently cured by surgery. They recommend surgical removal of localized tumors, followed by irradiation.

Some of our cases, where the disease was localized in the gastrointestinal tract, have done extremely well with surgery and x-ray. From a review of the data at hand it would seem that complete surgical removal offers the only chance of cure. Incomplete surgical removal has in our experience been an unsatisfactory procedure. The wounds heal poorly and are readily infected; only when there is a good chance that complete removal of all diseased tissues can be accomplished, should surgery be attempted.

Treatment with some form of irradiation is perhaps the most generally used therapeutic agent in this disease. From the series of cases quoted, and from our own observations, there is no positive evidence that life has been prolonged by this method of treatment or cure affected. If, however, one studies the cases individually, instances are found where this treatment was instituted early, and the patients are still living considerably beyond the usual time. There is also rather definite evidence that the cases, where surgery was attempted and removal was incomplete, have been very much benefited by postoperative irradiation. In some of these cases the wound did not heal until irradiation treatment was started. As a palliative measure radiation is of greater benefit than any other form of treatment. Complete symptomatic relief is the usual result of the treatment, and it seems highly probable that, in cases where there is marked respiratory obstruction, the treatment will also prolong life.

In the acute form irradiation, like surgery, seems to be contraindicated. The kind of irradiation used will depend somewhat upon the size and location of the lesion. It has been our experience that these cases are usually better handled with x-ray than with radium and that the short wave x-rays are better than those of medium length. The dose should never be large; undoubtedly death has resulted from too heavy dosage. The resistance of these tumors to irradiation varies considerably. At times they break down with great rapidity, producing a severe toxemia. For this reason it is well to start with a small dose, particularly if there is a large amount of tumor tissue present. It has been our practice to give from one-sixth to one-fourth of the erythema dose over one field only, repeating the treatment every other day until two-thirds of a full erythema dose has been given, unless the patient shows signs of toxemia, or the tumor begins to soften.

Since in the large majority of cases the treatment is palliative and is likely to be continued over a period of years, everything possible should be done to limit the amount of exposure to the skin and to keep the total irradiation as low as possible. By the use of short wave x-rays it is possible to administer to deep seated tumors of this kind a dose sufficient to produce satisfactory results, without exceeding two-thirds of an erythema dose to the skin. This dosage does not produce skin changes, even though repeated as often as every two months over a considerable period of time. It is also possible with short wave x-ray to give the necessary dose in the deep tissues with a much smaller amount of absorption in the overlying structures, thus avoiding roentgen sickness. We have not found it advisable to irradiate glandular groups which show no evidence of involvement or to repeat treatments as long as the patient is symptom free.

The medical care of these patients is particularly important. Anemia should be combated by hygenic measures and the use of arsenic. In some cases transfusion has given excellent results. The blood should be carefully watched. If a leukopenia develops, radiation treatment should be stopped. The basal metabolism may also be used as a guide to treatment; unless the metabolism is elevated, irradiation is usualy not advisable.

When unusual symptoms develop, a search should be made for lymphoblastoma in other organs. The gastric symptoms so frequently attributed to the radiation therapy may be due to a lesion in the stomach or bowel. Pain may be caused by pressure from a mass in the cord. Treatment directed to the areas involved usually relieves the symptoms. We recently had a small group of cases which developed tumors in the eye; these have also responded promptly to treatment.

SUMMARY

1. Those conditions of a malignant character. arising in lymphoid tissue and usually classified under various names, are discussed under the general heading of lymphoblastoma.

2. The fact that this disease attacks many organs not generally supposed to be included in the clinical picture of this disease is stated.

3. The roentgen appearance of the lesion in the various organs is described.

4. The selection of cases for treatment by various methods is considered.

5. A method of treatment with x-rays is outlined.

MALIGNANCY OF THE TESTIS*

REPORT OF FOUR CASES

GEORGE E. PFEIFFER, M.D.
TACOMA, WASH.
Chief of Surgical Service
U. S. Veterans' Hospital, No. 59

While malignant new growth of the testis is not rarely encountered, the admission of four cases to a general hospital of three hundred beds in five months is rather startling. Three of the tumors were surgically removed at this hospital; a fourth had been taken out elsewhere in November of 1924, and extensive metastases existed when received in December of 1925.

Two of the cases succumbed to metastatic involvement; one about a year following operation, the other six months after removal. Necropsy findings were obtained in both. A third patient submitted to surgery in December of 1925 and is apparently well. The fourth tumor was removed April 9, 1926. Symptoms indicating lymphatic involvement preceded operation rendering the prognosis exceedingly grave.

Two patients noticed onset of swelling two years before removal; a third, now living and apparently free of trouble, six months prior. The fourth, deceased, carried a tumor for four years. In none of our three cases operated on was radical removal of abdominal lymph nodes attempted. Neither does the history or examination disclose such a procedure in the fourth case. Complicating suppurative appendicitis practically precluded such surgery in one; symptoms suggesting metastases forced dependence upon deep x-ray therapy in the last case, operated on April 9, 1926, still living. Our third operative case was also subjected to deep roentgen-ray therapy.

A decidedly pessimistic opinion prevails among the staff concerning the feasibility of surgically eradicating even early lymphatic involvement among the retroperitoneal structures. The discouraging outlook in this direction is not benefited after noting the widespread retroperitoneal new growth at necropsy in two cases. The impression that extension must be exceedingly limited and early is further enhanced upon reviewing the anatomic possibilities in the extensive lymphatic network requiring thorough removal. The microscopic nature of the metastatic process and the grossness of even the utmost delicacy of technic allowable in a region filled with trunk lines and vessels of the body would seem to render surgical methods about hopeless when employed alone. In further explanation it is recalled that lymphatic drainage of the testis is accomplished along the spermatic vessels to the lymph nodes and channels, constituting the lumbar chain and practically surrounding the great vessels and branches springing therefrom.

The microscopic appearance of all four tumors affords excellent opportunity to remove further the belief yet held in many quarters that sarcoma is the prevalent type of malignancy. Ewing[1] in an admirable treatise throws much light upon an exceedingly chaotic subject. His idea of a single embryonic origin of the great majority of testicular tumors is well supported. The author attributes all of the common and many of the rarer growths to totipotent sex cells, probably nearly mature spermatoblasts or their near antecedents. Monodermal forms supposedly represent one sided developments of three layer teratomas. He is skeptical of origin in structural cell elements of the testis for malignant growths, granting rare exceptions. Such views place the study upon the rather firm basis of teratomous origin and provide a fairly practical working classification.

Three main varities are given: (1) Adult embryomas or teratomas, (2) embryoid, teratoid or mixed tumors, (3) embryonal malignant tumors. In practice the classification is not so simple and many forms are intermediates.

The first group is small and constitutes those in which definite fetal organs are present in rudiment and a resemblance to order is present. The typical example of this class is the sharply circumscribed dermoid. Skin elements line the sac which is usually filled with sebaceous material and hair. The embryo projects and is contained in a protuberance within the cyst. Multiple cysts often occur. Microscopically various tissue elements are made out, ranging from muscle to brain. It is interesting to note that as early as 1696 Saint Donat described a rudimentary skull and pigmented optic disc in a testicular tumor. Fetal limbs, teeth, and salivary glands have been identified. These tumors are relatively infrequent; the course is slow and rarely do they become malignant.

The second group, somewhat more frequent, are the teratoid or mixed types. The structures, while derived from all three germ layers, are chaotically arranged and do not resemble an embryo. There is a tendency for derivatives of a particular germ layer to overgrow the others, giving rise to true malignant characteristics. Recognition is due to the presence of definite tissue elements in great confusion. Carcinoma may originate by overgrowth of neuroepithelial elements.

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The third group, named by Ewing[1] embryonal malignant tumors, constitutes the most frequent neoplasms of the testis. These are the so-called sarcomas, with which we were at one time liable to class all malignant new growths in this region. Large polyhedral cells of embryonal type lie diffusely or in large alveoli, often surrounded by a stroma rich in round cells, hence the supposition of sarcomatous basis. Many workers have found teratoid elements, such as cartilage contained in the masses, which together with other factors lead to the belief that all originate in teratomas. The tumor grows very fast and is usually soft and opaque. Necrosis and hemorrhage are present after the mass has attained considerable size. It originates in the rete of the organ, gradually destroying the normal structure by encroachment and pressure. Spread through the lymphatics, vessels take place early, rendering recurrence and metastases usual following excision. The lungs, brain, liver and lymph nodes quickly show invasion.

A peculiar form of teratoma is known as chorioma. The course and structure are identical and duplicate in all details of that of the uterine tumor (Ewing[1]). The primary growth is often overlooked as it is usually small.

REPORT OF CASES

Case 1. S. E. H., a Caucasian, thirty-five years old, entered October 1, 1925, as an emergency with acute symptoms pointing to the lower right quadrant of the abdomen. Shrapnel injuries in the right groin in 1918 had long since healed. Right inguinal hernia had occurred with repair accomplished also in 1918. The right testis had begun swelling in 1921. The condition had progressed and become very painful. Tuberculosis had been diagnosed.

Acute cramping pains in right side of abdomen occurred suddenly while carrying wood the day of admission. Gastric disturbances did not follow; the bowels were constipated and inappitence prevailed. The temperature reached 101° F., and slightly over with a pulse of 96. The patient lay fully relaxed; the abdomen was moderately obese in configuration; spasticity was not present and masses or assymmetry could not be demonstrated. Considerable tenderness existed over the cecum when firmly pressed. The right side of scrotum contained a tense opaque mass, involving both epididymus and testis, the size being about twice normal. The skin was unbroken and general nodulation with tenderness existed. The cord structures did not seem enlarged. The prostate was moderately increased in size, tense and tender. General examination disclosed nothing of note except advanced pyorrhea alveolaris and the lungs were especially clear.

Need for extreme caution in the diagnosis was recognized. Without considering the tumor, appendicitis of acute type was thought likely but with the presence of the former showing acute signs also, procrastination was indulged in over thirty-six hours. A leucocytosis of twenty thousand rising to twenty-nine thousand at the end of that time determined operation for inflamed appendix. The temperature had hovered around 100° F., and the right quadrant symptoms persisted unabated. The blood Wassermann was negative.

On the morning of the third day the appendix and right testis were removed. The appendix was bound down in iliac fossa by recent fragile adhesions. The organ was edematous and filled with fecal material. The vessels were congested and the markings of the latter exaggerated. The mesoappendix was extremely friable. The epididymus and right testis were almost completely replaced by numerous fused, firm granulomatous tumor masses, varying in size from a hazel-nut grossly, down to a navy bean. Necrosis or debris was not demonstrated on cut surface. The latter was oily and pebble-like. The proximal two-thirds of the testis was the seat of the most marked pathologic process. There was a small amount of yellowish syrupy fluid exuding from the cut surface. In appearance it was yellowish and glistening. Testicular detail was destroyed. The tunica albuginea had not broken through into the scrotal sac and the entire mass was covered by glistening membrane. The vas was not thickened and the cord structures otherwise were normal.

I am tempted to associate the acutely congested appendix with the tumor in the light of further progress of the case. No attempt to remove spermatic structures intraabdominally was made, limiting the procedure to a simple orchidectomy and appendicectomy. Dr. P. A. Scott, pathologist, reported a mass including the testes and epididymus measuring 7.0 cm. wide by .0 cm. long and 3.2 cm. thick. The cut edges bulged and the tissue was very edematous. The tunica vaginalis striped easily, leaving smooth tunica albuginea. One part of the testis was soft, almost gelatinous in the center, and one pale, very firm and of white cartilage-like tissue. The epididymis was also edematous and enlarged. There was much blood in the epididymis.

Microscopic sections of the testis showed such a marked necrosis that the cells fixed and stained very poorly. They comprised a solid tumor mass of small polygonal and oval-shaped cells with a scanty supporting stroma; there was also a marked infiltration in areas with lymphoid tissue. He diagnosed embryoma of the testis, malignant in character.

Operative convalescence was uneventful. The febrile and pain symptoms subsided almost immediately and the patient was up in the ward with healed wounds in about two weeks. Considerable induration existed along the inguinal canal on the affected side associated with some tenderness. Both subsided under artificial heliotherapy and the patient received his discharge to an out-patient status about one month after operation, as he was anxious to return home. Some discomfort in epigastrium and lower abdomen soon ensued, merging into rather severe gastric post-food pain late in November. Thirty-five pounds were lost in the two months since onset of acute symptoms and operation.

He was admitted December 8, with above complaints and aching in back and right groin. Examination now disclosed a palpable mass in the epigastrium about as large as a medium-sized orange, immobile and slightly tender. Some fullness and tender induration existed in the right inguinal region. Fever was not present; leucocytes numbered sixty-six hundred and the red blood checked normal. X-rays disclosed a tumor shadow in each lung, not demonstrable clinically. Marked hypoacidity existed and roentgen ray study revealed pressure distortion of gastric contour.

Deep x-ray therapy was instituted about December 16 at the Tacoma General Hospital. On January 7, 1926, the patient returned. He was very weak, nervous and unable to walk. Occasional "sinking spells" were complained of and the appetite had about entirely failed. X-ray of the chest January 11, as interpreted by Dr. I. A. Dix, revealed marked increase in number of tumors discernable; eight being counted in the left lung with two large right lung invasions, evidently encroaching from the mediastinum.

Decline rapidly continued with death March 5. Necropsy revealed extensive metatases involving the lungs, the liver and the nodes about the celiac axis and great vessels. The growth had invaded the renal veins. The prostate was moderately sclerosed and enlarged, and a few calcareous casts were found in the left seminal vesicle. Permission to open skull was not obtained.

Case 2. L. A., thirty-five years old and white, was admitted December 3, 1925, complaining of a growing mass involving right testis for six months. Gonorrheal urethritis had occurred in 1923 with complications. Records stated that the testicle had swelled to thrice normal then, and tenderness existed over the epididymus and vas. An epididymotomy had been done and the vas injected with argyrol, instituting drainage for twenty-four hours. The patient stated the organ reduced to normal size and remained so, until six months before. The swelling had not pained.

General examination was essentially negative; many teeth were missing and others carious. The scrotal tumor, measuring approximately 10 cm. in all planes, obliterated normal testicular detail; light did not pass and a cystic sensation was encountered during palpation. The blood Wassermann was negative. Urethral discharge not demonstrated.

Simple orchidectomy was done December 11 and the following noted: "Enormous tumor involving the right testis and epididymus as large as a medium-sized grape fruit. The tunica was adherent to the scrotal tissues and the cord structures were much thickened as a whole. Section through the tumor revealed gelatinous degenerative changes throughout with considerable connective tissue and a generally wet, greasy appearance."

Dr. P. A. Scott reported: "Microscopic sections show a structure composed almost entirely of large round and polyhedral-shaped cells with a hyperchromatic nucleus and pale cytoplasm which is slightly granular. The cells vary in shape and size markedly. Interspersed among these cells is a marked infiltration of round cells. The tissue is very edematous. There is an unusually marked proliferation of fibrous tissue which occurs in some regions in wide bands. All of the normal structure of the testis is destroyed. In some areas the tumor cells are supported only by new blood vessels. Microscopic diagnosis: Embryo carcinoma of the testis."

Deep x-ray therapy through the abdomen was instituted January 8, 1926, and eleven exposures made during twelve days by Dr. E. D. McCarty of the Tacoma General Hospital. Careful x-ray check of the lungs failed to reveal metastases. A stereogram of the pelvis shows considerable clouding and lack of detail through the right sacroiliac joint. The significance is not determined, though the process is probably a concurrent arthritis. On February 4 the patient was discharged in excellent condition with a request that his case be rechecked in three months. We are hoping to receive the results of the reexamination soon.

Case 3. S. C. F., white, male, aged thirty-five years, a laborer, entered December 10, 1925, with a diagnosis of sciatica. The chief symptom was severe persistent pain in the lower extremities. In 1922 the left testis had been injured by accidental striking. No particular attention was paid the trauma. A month later the organ enlarged and the cord pained some. The swelling and annoyance progressed. In October, 1924, a second injury occurred, similar in character, resulting in considerable pain and a pint of fluid was removed by aspiration.

When examined by Dr. Paul W. Sweet of Centralia in November, 1924, fluid was present, with tumor involving testis and epididymus, nodular in contour and hard. Blood Wassermanns at that time were negative, as was an x-ray of the lumbar region. Malignancy was diagnosed and the mass removed in the same month, including a large portion of the cord and scrotal tissue. Medullary carcinoma was reported after section study.

Further data are lacking until July 4, 1925, when severe gastric pain occurred; "gas" filled the lower bowel, he stated, and severe pain attacked the left knee, soon involving the hip and foot. The gastric and other symptoms grew steadily worse, rendering him bedfast. Both hips, thighs, legs and feet became very painful. Urethritis had occurred in 1919.

Examination revealed rather marked sciatic nerve involvement. The left testis was absent. The abdomen was reported negative by the examining physician except for a healed appendix approach scar. Slight fever was noted. Chest x-rays were negative. Syphilis was not demonstrated. The gonococcus complement fixation test returned a three plus reading. Sedimentation velocity of the blood corpuscles was eighty minutes. (This dropped to fourteen minutes in two weeks.) The patient's condition grew steadily worse and it became apparent on the neurologic service that metastases were the underlying factors.

Death occurred in February, 1926. The necropsy revealed a startling abdominal condition. The retroperitoneal structures had been cemented into a dense huge mass by the encroachment of tumor into the lumbar lymph nodes, with fusion and spreading of new growth to envelop vessels, nerves and kidneys. The vessels contained irregularly placed thrombi, probably neoplastic in nature. The reason for sciatic symptoms was obvious. A stippled deposit lined the aorta. The liver contained huge rosette tumors; the left kidney was dilated hugely by occlusion and back pressure. The lungs did not contain gross metastases though pneumonia was demonstrated.

Dr. Scott's report of the tissue study is abstracted as follows: "Microscopic sections of the liver show in one corner a tumor mass, composed of fairly large polyhedral shaped or round cells which vary in size and are packed rather closely together. The nuclei are fairly dense with chromatin. In some places these cells are invading the liver cords but for the most part they lie distinctly in one group by themselves. Sections of the vena cava show a large thrombus which is well organized and shows an unusually large amount of fibrous tissue. Most of the kidney tubules are destroyed and there is an infiltration with large numbers of round and some endothelial cells. There is a good deal of hemorrhage. No necrosis and no new-growth or tubercles are seen. Sections of the fused lymph nodes show fairly wide fibrous bands, in which are growing masses of tumor cells resembling those seen in the liver."

The findings of metastatic carcinoma were plain. The nervous system was not examined.

Case 4. S. N., was admited February 25, 1926, at the age of thirty-nine, being a white male and a logger. His mother died of tumor at thirty-seven years of age.

Average health occurred until two years ago, when the left testis began to enlarge slowly without pain. Several months ago pain became severe at times in lower part of the abdomen and back, requiring morphine for control. He complained upon admission of burning pain in left testis with swelling and shooting sensations occurring through the lumbar region and lower abdomen; some digestive disturbance after eating, consisting of radiating knife-like pains in epigastrium.

The physical examination disclosed a fairly normal individual, except for a tumor the size of a large pear, occupying the left side of the scrotum, which was smooth and elastic in character and impenetrable to light. The prostate was generally enlarged and tender, the left lobe being quite nodular. There was considerable dental disease present. A gastrointestinal study by x-ray disclosed marked distortion throughout the duodenum, suggestive of spasm, but which might be due to adhesions attaching the gut to the gallbladder. The spine and pelvis are negative to x-ray examination. A slight sugar and albumin reaction was present in urine. The blood Wassermann was negative; sedimentation velocity was thirty-five minutes on February 26. A complete blood count did not reveal abnormality in March. Blood chemistry at that time revealed essentially normal findings. A gastric analysis showed some hypoacidity.

A preoperative diagnosis of tumor was made, probably malignant with metastases in the abdomen. Operation April 9 revealed a tense elastic swelling, filling the left side of scrotum, nonadherent to skin, which did not transmit light. The cord structures were generally thickened. Upon incision of the skin and tunica a moderate amount of straw-colored fluid gushed forth, due to a protective hydrocele. The testis with epididymis was enlarged markedly, measuring approximately 11.0 cm. in long axis by 7.0 cm. in width and 5.0 cm. thick. A linear incision through the testis and epididymis in sagittal plane showed a uniform lobulated hyalin structure, the surface of which was moist and pebbly in appearance. A triangular yellow area was present posteriorly, the apex pointing toward the middle of the testis. This was evidently of lipoid material and suggested teratomatous origin. There was slight hemorrhage in one area of the cut surface. Necrosis was not noted. The tunics were intact over the surface of the organ. The vas was not markedly thickened, though the accompanying structures were moderately so. Dr. P. A. Scott, local pathologist, concludes report of section study with microscopical diagnosis of embryo carcinoma of the testis.

After microscopic study of the new growth Dr. L. H. Prince[2] reports the following: "A malignant tumor composed of large vascular nucleated cells, each invested with a medium cytoplasm. The total cell volume is greater than the so-called large round cell sarcoma, and the cytoplasm is pale or granular, disposed in radial or stellate form around the nucleus. The cytoplasm does not correspond in distribution to that of the ordinary epithelial cell, that is, sharply circumscribed around each nucleus. These cells occur in masses enmeshed in a very heavy stroma. Throughout most of the cell masses delicate but completely formed capillary vessels are seen. The sections are richly sprinkled with eosinophiles, which suggests the presence of a chronic inflammatory reaction in this tissue."

He has tentatively classed the mass as a "confusion tumor," reserving conclusions until more exhaustively studied. He mentions that this tumor is frequently referred to as large round cell sarcoma, but that there are too many indications of adenocarcinomatous growth.

In removing the tumor, the inguinal canal was opened as far as the internal or abdominal ring, where cautery section of the cord was accomplished, followed by completion of the orchidectomy. This patient is now undergoing a series of deep x-ray exposures and the course is being observed with interest.

An analysis of the four cases suggests their inclusion in the third class of Ewing,[1] that of embryonal malignant tumors. Case number three contains a report of medullary carcinoma. It is probable that this may be classed as embryonal adenocarcinoma, a distinctive type requiring considerable study to establish its teratomatous origin.

SUMMARY

Four cases of malignant neoplasm of the testis have been studied within five months with acute appendicitis associated in one. Conservative orchidectomy was done in all. Two have gone on to necropsy; one remains well four months after removal; the fourth tumor was recently removed and the patient exhibits some signs of metastases.

Trauma distinctly figures in three cases; the fourth gives no evidence of such.

Extensive dental disease existed in at least three cases, causing speculation as to the influence of such foci. Specific urethritis was admitted in two cases.

The age incidence is thirty-five years in three cases and thirty-nine in the fourth.

The duration of symptoms until operated on is six months in one case (epididymotomy two years previously for swollen organ); five years in another and two years in a third and fourth.

Microscopic sections of three primary tumors and metastatic material from a fourth case reveal the characteristic cell structure and stroma to suggest their classification in the third group of Ewing,[1] that of embryonal malignant tumors.

CONCLUSIONS

The theory of teratomous relation of testicular malignancies is supported by the study of four cases, all exhibiting carcinoma originating in a mesodermal organ.

Control of metastases in the average case presenting at the stage of annoying or painful tumor is exceedingly doubtful. Review of the anatomy involved and study of spread in two cases reveals the discouraging situation confronting the surgeon who would attempt radical operative measures.

Deep x-ray therapy after removal of the primary growth seems the more logical method and affords hope only when symptoms of spread are lacking.

The association of trauma to onset and the presence of infectious foci are significant. It is regretted that more exhaustive microscopic study was not done in the cases with a view to firmly establishing the teratomatous relation of the tumors.

Sexual differentiation of the reproductive glands is not apparent until the fifth or sixth week in utero. Chronologically the precursors of ovum and spermatozoa are not far removed from each other. It may be that the immature cells of each are even more closely related and homologous diverging with the stage of development of the cell. Abnormal stimulation, then by trauma and toxin, might, when affecting the young spermatoblast, result in the charatceristic phenomena of the developing ovum, the teratoma resulting. The possibilities are innumerable, depending upon the varying factors involved. Such a theory might well apply to similar occurrences elsewhere, granting first the inclusion of the immature sex cell in a foreign tissue environment, the latter in itself furnishing the trigger stimulus to be released by trauma or infection.

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THE OUTLOOK IN CANCER*

William J. Mayo, M.D.
ROCHESTER, MINN.

From the dawn of history man has been engaged in battling for life against visible enemies, but as civilization has advanced, more subtle enemies have been brought to light.

Scientific medicine had its beginning in the fourth century before the Christian era with Hippocrates, who founded clinical medicine, and his near contemporary, Aristotle, who developed deductive reasoning, on which science rested securely for 2,000 years. In the sixteenth century Francis Bacon introduced inductive reasoning into philosophy. William Harvey, contemporary of Bacon, applied inductive reasoning to medicine and by experimentation established physiology on a sound basis. In this great Elizabethan or Shakespearean century came also the first of the physician-chemists, John Mayow, whose investigations led to the discovery of oxygen. In 1595 the Jensens brought out the microscope, an invention which was to revolutionize science.

The source of 95 per cent of all knowledge is ultimately visual. The invention of the microscope increased the power of vision and made possible the epochal work of Pasteur which brought about the popular recognition of the role of microorganisms in the causation of disease, with the result that the scourges of contagion, infection and infectious diseases, which could only be survived by persons with natural or acquired immunity, have nearly disappeared. Today vision is being extended into the ultramicroscopic field which concerns those biochemic changes which bring about degenerative diseases of middle and later life. Our newer knowledge of the colloid and molecular changes in the tissues and fluids of the human body is vitally influencing the practice of internal medicine through immunization and reconstruction.

The idea that cancer is increasing may be erroneous; it is possible that this conception has its origin in the fact that more cases are observed than formerly, both because life expectancy has increased and because the significance of cancer has been given popular recognition. The increasing number of deaths from cancer and diseases of the heart, kidneys and other vital organs gives occasion for hope for the future rather than for discouragement, because these are the affections of middle and old age and prove the advance of the medical frontier. In the older day the greater number of human beings died before the period of life at which these diseases develop.

Virchow was the first to propound the theory that the cell is the unit of life. Cancer consists wholly of the parasitic cancer cell. The stroma represents nature's defense. Nature treats this malignant cell like a foreign body, throwing out connective tissue around it, which contracts and cuts off the blood supply. This no doubt often results in complete obliteration of the cell. Postmortem examination in cases of metastatic disease in the lungs, for instance, will not only reveal large areas of cancer, but also extremely small areas. Scattered through the lung tissue are sometimes to be found little nodes of connective tissue which do not enclose living cancer cells, and yet one must conclude that they originally contained cancer cells which later became obliterated. Irradiation not only destroys the colloids of the embryonic cell and obliterates smaller blood vessels, but also develops such masses of connective tissue as will, no doubt, eventually destroy some or possibly all of the cells that were not killed by the rays.

If the cancer cell is compared with the normal cell, it is found that the normal cell, as an oxidizing mechanism, not only converts energy into growth, but also provides for function. In other words, a normal cell balance is established between the amount of nucleus and the amount of cytoplasm. The cancer cell, by reason of its enormous nuclear development, converts all the energy derived from the oxidation of its nourishment into growth, without function, and in this growth it takes its nourishment from the normal cell.

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The normal cell can be compared to a machine which produces just enough energy for its proper purposes. The cancer cell oxidizes material like a fire until it degenerates and undergoes necrosis in those parts which have lost their ability to obtain nourishment, the ashes of a conflagration. The resemblance has long been pointed out between fertilization of the ovum by the spermatozoon, which gives the ovum power to grow and the action of some unknown substance which so disastrously stimulates the embryonic cell into abnormal growth. As to what this stimulating substance consists of, there are an enormous number of theories and a paucity of facts.

Gye has added two important new facts to the knowledge of cancer in connection with his work with the Rouse sarcoma in fowls. He showed that in the transmission by a cell-free filtrate two factors are involved, one a particulate, the virus, and the other a nonparticulate, called by him the "specific factor." To produce sarcoma in fowls these factors must be present together.

Careful investigation of human cancer appears to show that possibly from 75 to 80 per cent of persons have more or less immunity to the disease and do not develop it under ordinary life stress. The trend of laboratory research might indicate that possibly cancer can be induced in the majority of the remaining 20 or 25 per cent of persons by sufficient chronic irritation, which probably destroys the cancer resistance mechanism. Miss Slye is able to breed at will strains of mice which never develop any type of neoplasm under any type of irritation (coal tar painting) tested in the laboratory. She is able also to breed at will strains of mice which will readily develop the disease and, as a result of the ordinary wear and tear of physiologic function, may even be born with it.

I have never observed a case of cancer in which there had not been some preexisting instability of the tissues or long continued irritation. It would seem as if the long suffering tissues respond to the chronic insult of the injury by supplying for repair cells less and less mature, until finally, through sheer inability to supply sound cells to heal the lesion, the tissues may reach a stage, in those persons with little or no immunity, in which there is uncontrolled production of unsound cells, too immature to heal the breach of continuity, or to furnish surface protection to normally protected tissues.

Any spot in the body, either inside or outside, where there is constant irritation of any kind, may become the situation of a cancer. This is shown by the frequency of cancer in unusual situations among members of certain races.

In Cashmere, in cold weather, the natives wear for warmth next the skin, small baskets filled with live coals. Heat irritation results and cancer of the abdomen is common, comprising over one-half of all cancer found among these people. This form of cancer is very rare in other countries.

Among the Chinese, the men always eat first, throwing masses of hot rice forcibly into the mouth with chopsticks. Cancer of the pharynx is very common among Chinese men. The women, who eat after the men have finished, when the rice has had time to cool, do not often have this form of cancer.

Women who used to wear the old style high, stiffly steeled corsets frequently had cancer of the breast. Cancer of the tongue may be started by sharp or rough teeth, cancer of the lip by the irritation of a clay pipe, cancer of the gallbladder by irritating gallstones, and cancer of the stomach may be due to chronic gastric ulcer or indirectly the result of hot food and drinks.

Admitting that we do not know just why chronically irritated tissues fail to repair their damage completely, we are by no means convinced that cancer is dependent on an external agency in the general nature of a living organism, bacterial or protozoal. The stumbling block to this belief in an external parasitic agency is the fact that, when malignant cells travel through the lymphatics, or through the vascular system and become transplanted to a distant organ, the resultant growth is always made up of the type of cell of the organ in which the cancer originated. When, therefore, cancer metastasizes from the stomach to the liver or the lungs, the new growth is a cancer of the stomach, in a different situation, which has converted to its use, so to speak, the nourishment of its host; it is in no sense a cancer of the lung or of the liver. One would reason that, if the causative agency of cancer is something outside the body, then when this agent is carried to the liver, lungs, or other tissues, it would cause cancer of these tissues. A rather unsatisfactory hypothesis has been advanced which presupposes that the causative agent is ultramicroscopic and is carried with, and acts only on, the cells to which it had become acclimated in the primary focus.

The pathologist of the older day studied dead tissue. His reports on the tissues removed at operation went to the surgeon several days after the operation was completed. While there was educational value to the surgeon and the pathologist under this regimen, there was no benefit to the patient. Wilson, twenty years ago, introduced the method of instantaneous staining of frozen sections by polychrome methyl blue, which has been one of the most important contributions to the study of the pathology of the living. By this procedure the surgeon receives a report as to the nature of the tissue removed within two or three minutes while the operation is in progress.

MacCarty, in his study of cellular pathology, states that the volume of the nuclear elements of the cell in proportion to that of its cytoplasm indicates the cell's possibility of growth, and notes that, if the cytoplasm of the cell does not undergo differentiation, there will be no physiologic function.

Broders, in formulating his index of malignancy, studied the microscopic cellular elements of squamous-cell cancerous growths from 1,628 patients in the Clinic, without reference to the case histories. He divided the cases into four groups, representing grades of cell maturity: Grade 1, cancers in which 75 per cent of the cells were differentiated and 25 per cent embryonic, or undifferentiated; Grade 2, cancers in which the differentiated and undifferentiated cells were about equal; Grade 3, cancers in which 25 per cent of the cells showed evidence of differentiation, and 75 per cent no differentiation, and Grade 4, cancers in which none of the cells approached the normal. The ultimate results following operation were then investigated, and it was found that in Grade 1, good results were obtained in 92 per cent of the cases; in Grade 2, in 62 per cent; in Grade 3, in 25 per cent, and in Grade 4, in only 10 per cent. This method of grading malignancy was then applied to a larger series of cases, and the findings confirmed. Broder's work confirms, pathologically, what has long been known clinically, that cancer varies greatly in malignancy, and its curability depends on the nature of the cells which compose it, as well as on the stage of development.

Evans, in 1919, studied the pathologic conditions in 4,000 cases of uterine myoma in the Clinic, in order to determine the percentage undergoing sarcomatous change, and demonstrated that the percentage of miotic figures of cells of the malignant connective-tissue group gave a reliable index of the malignancy. His findings agree with those of MacCarty, that the greater the amount of nuclear material in proportion to the cytoplasm of the cell, the more rapid the mytosis and the more malignant the growth, emphasizing the fact that so far as the cellular growth is concerned, the nucleus is the source of the proliferation.

Bowing, working with radium in the Clinic, found that cancers which before operation were undifferentiated or highly malignant, after irradiation, which did not destroy the cell, showed changes in the cytoplasm of the nature of a developing differentiation; that is, a tendency to assume the appearance of normal adult tissue, and, therefore, were less malignant.

The malignant cell is less resistant to heat than the normal cell and, as shown by the work of Percy and others, heat can be used in a manner to kill the cancer cell without injury to the normal cell.

Bell, of the University of Liverpool, has found that persons working in lead industries become temporarily sterile, and also that lead has markedly deleterious effect on embryonic cells. In a large series of investigations he has used a therapeutic preparation of lead in certain advanced cases of cancer.

Chemical poisons other than lead, of which arsenic and colloid gold are examples, have been shown to have a similar effect on cancer.

Coley, by the use of toxins, in some instances has secured phenomenally good results in cases of cancer.

Fischera, of the University of Rome, made a serum from the human embryo which appeared to have some power in causing the reduction of malignant growths.

We may surmise that all of these agents act on the susceptibility of the embryonic and, therefore, less resistant cell nucleus, which controls oxidation. These examples suffice, however, to show that many agents, acting either by stimulating reparative processes of the body, or by directly affecting the metabolism of the growth itself, probably both, markedly influence cancer. Pain is relieved, the growth reduced in size, and the patients gain strength, but unfortunately, few are cured.

Just now the medical profession, as well as the public, is suffering from an influx of widely heralded serums and other forms of treatment for cancer in the hands of men who are, as a rule, of the type of the quack, lacking in knowledge or honor, frequently in both. These serums are called cures, but, while there is evidence that definite alleviation sometimes follows their use, they do not cure. Patients with large, incurable growths are led to believe that they are being cured, and wax enthusiastic over fancied or real improvement, which is proclaimed as proof of cure. Obscure notices in the obituary columns of a later day do not confirm these claims, but unfortunately, these death notices do not receive the same publicity as the alleged cures.

As pointed out, there is evidence to show that every person is more or less immune to cancer. In many cases organs may be subjected to chronic irritation for years without developing cancer; it may be assumed, therefore, that they have a high degree of immunity. It is equally evident that others have little immunity. Medical science has succeeded in immunizing against smallpox, scarlet fever, diphtheria, snake venom, and other diseases and poisons. It would seem that a logical line of investigation would be to determine whether it is possible to secure knowledge as to the exact nature of this apparent cancer immunity, and whether a prophylaxis might be found.

Production and Handling of Human Milk. The production and handling of human milk by the Children's Welfare Federation of New York was begun, Oct. 6, 1921. From that date to May 1, 1926, 5,296 quarts represents the total amount that has been produced and distributed by this agency. Henry Dwight Chapin, New York (Journal A. M. A., Oct. 23, 1926), describes the procedure employed to secure this milk. One mother has nursed her three children and at the same time sold 400 quarts of her extra milk, which has netted her an income of more than $1,700, during the four years. Another healthy young mother earned $987.98 with her extra milk during a year's lactation, and nourished her own baby as well. Lactation can be prolonged to the fifteenth and even the eighteenth month, and the composition varies but little from the earlier to the later period. A specimen of the pooled milk is analyzed every month. The assays show that the fat, protein and lactose are fairly uniform, and in this way human milk is similar to the herd milk of cows. Human milk acts much as cow's milk in keeping qualities under similar conditions. The difficulties of the work consist in securing a steady and continuous supply of mothers, in advertising and popularizing the sale of the milk, and in preserving the milk so as to regulate supply and demand. Chapin asserts that perhaps the best future solution of this problem will lie in the direction of drying the milk according to the method of Drs. Emerson and Smith. During 1925, 170 babies were supplied by the federation; forty-six were reported as having died, only eleven of whom received more than 100 ounces of the milk; twenty-four were lost sight of and 100 recovered. To some of these babies, this milk offered the last chance for life. The desperate condition of the patients is shown by the reported causes of death, prematurity, pyloric stenosis, intestinal obstruction and malnutrition heading the list.

THE IMPROVEMENT OF OUR POOR SURGICAL RESULTS*

John C. Lyman, M.D.
WALLA WALLA, WASH.

Every member of the surgical profession has some poor results to contend with, some of us more than others. This is not simply a personal matter for that individual operator, but it concerns the entire profession which is judged by the results of the individual. It might be added that it is a much more serious matter for the patient who is so unfortunate. This finds a practical application in every community, where a few poor surgical results may drive many cases away to another city for operative work, or else away from the profession entirely into the hands of the quack. In other words, every time we show poor judgment and fail to deliver the best service to our patients, we are lowering the standards of our profession.

Now our question is, "How are we going to improve the results in surgery for the entire profession?" Generally speaking, a poor surgical result means lack of ability on the part of that surgeon to cope with the condition which the patient presents, or else a mistake in judgment. It would seem a very simple matter to answer this question on paper by saying, regulate the practice of surgery by law so that only the well trained man is permitted to practice it; and, second, in our hospitals have an organization which can, not only demand proof of the man's ability to do major surgery, but also demand that he write a careful history and physical examination, followed by the use of all the indicated modern laboratory methods, before he is permitted to operate on each individual case. Undoubtedly this procedure would reduce our poor results in surgery very greatly. However, the putting of this procedure into practice is a very difficult matter, as we all know who have had to do with hospital organization and management.

The standardization of hospitals under the minimum standard has done much to remedy the situation, but when it comes down to careful analysis, it has barely started to solve the problem which it has to deal with. It is the one organization which is on the right road and perhaps its weakest point is its inability to provide a working machine which can enforce the standards which it provides for, especially in the smaller centers.

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* Read before the Thirty-seventh Annual Meeting of Washington State Medical Association, Spokane, Wash., June 28-30, 1926.

Any change in our state laws in regard to licensure or in the operating of our hospital organization for the betterment of our surgical results will have to come from within the profession itself and by a united effort. Surgery and medicine seldom come into disfavor because of the acts of the reputable and well trained member, but it has been and still is being brought into disfavor by the work of the unscrupulous and incompetent, who are so willing to attempt major surgery, even though they have no special training for it. We are continually talking about the quacks and the damage they are doing the public and trying to safely regulate them by law, but it seems we are doing so little to better conditions within our own profession for the protection of the public.

We could do much, if we would get together and formulate some more rigid and practical methods of licensure for the practice of medicine and surgery. As it is, a graduate of most any medical school is able to pass our present state boards and then is given a license to practice not only for the simple and common ills of life but also is given permission to operate on anyone for a minor or major complaint. Is this protecting the public as well as upholding a high standard for our profession? Is there any reason why we cannot take these candidates for admission to practice to our city hospitals, and for an examination give them cases on admission to hospital and have them work up the cases with history, physical and laboratory work, make a diagnosis and treat the case, instead of asking them simply to write down on paper a description of such and such an operation which anyone can do if he has read his books, even though he may never have seen a case. This is certainly a very necessary method, if you are going to determine whether a candidate has the ability to do major surgery and should be given a license to practice it. This would do much to protect the public from the hands of the incompetent.

It would seem that some such plan would appeal to any conscientious member of the profession. Such a scheme would mean that any man who wanted to do surgery would equip himself to do so before coming up for examination, instead of getting a license and then going out to learn how on the public, at the expense of some of their lives. And we all know that at present there are plenty of opportunities for resident work in surgery in all of our large hospitals for the man who has ability and is willing to put in the time to learn. If he is going to do major surgery which deals with the lives of the members of the community and where incompetency may mean loss of life, he should be willing to put in the time to properly train for this work.

Now what we are going to do about all these members of the profession who are already licensed, such as ourselves? Probably we should ask ourselves some rather pointed questions. Does any well meaning surgeon think he is doing as good work as he should? No. How can he tell? What can he do to find out whether he is doing as good work as he should? Does he feel that because he is in a small community he is handicapped and should be excused because he does not get as good results as in the larger center?

The larger clinics of the country have done much for the surgical world. They have not only kept complete records of the cases they have treated, but have established a "follow up" system, so they can tell us what their end-results are. Such records mean much for the advancement of surgery, but they also furnish us with a standard by which we can judge the quality of our own work.

When a clinic sums up large series of cases and shows a mortality less than 5 per cent of cholecystectomies, thyroidectomies and prostatectomies, what does it mean? It means that, unless our results compare favorably with the large clinic's as a standard, there is something wrong with our work. Even though we are in rather small centers, there is nothing to hinder us from getting just as good results, provided we are making use of what is common knowledge among the better men of our profession. It simply means we are not working our cases up properly.

It means we are not properly preparing our jaundice cases for operation in light of latest laboratory methods and are not showing proper judgment as to time to operate on gallbladder. The same is true of thyroid cases. Some of us are doing thyroidectomies and have never carefully worked out the physiology and pathology of the various types of thyroid disease, each of which calls for a different preoperative preparation. Unless we do this and have an understanding of the physiology and pathology in each individual case, we will not choose the right time to operate and our mortality figures will be high. This is even more true of prostate work. Unless one is familiar with the pathology of the kidney secondary to urinary obstruction and makes intelligent use of renal function and blood urea determinations, he is sure to make some grave errors in choosing time of operation. It is well always to judge the condition of the patient by his looks, but after you do this be sure to check your judgment against laboratory findings and then you will reduce your mortality to a minimum. Anyone who has done much prostate surgery knows that the operation is the least part of the work to be done. It is a mere incident which comes after the proper preparation and is followed by a careful postoperative procedure.

The time has come when every surgeon must be a good gross pathologist and also have intimate knowledge of physiology and be able to interpret the laboratory findings for each individual. This does not mean that he is to depend on the laboratory for his diagnosis. It means he is first carefully to work his case out with history and physical examination and make a diagnosis, and then he is to use the laboratory as a check on his findings.

Take the question of a lump in the breast. At the time of operation he has already written down his diagnosis before starting, and when he operates he should be able to tell in the gross what type of tumor he is dealing with by the gross appearances. Then he should be prepared to have frozen section done at the time of operation for a check on his gross diagnosis. If things are done this way, his follow-up end-results will be improved.

We all know that many of our poor results are due to lack of knowledge of pathology and physiology with which to form a judgment at the time of operation. We too often are trying to make the patient fit into one set text-book type of operation, instead of doing an operation to fit the individual case at hand. We all know that this is the great weakness of the average man doing major surgery. He may be a fair technician, but has poor judgment of what to do and when, because of lack of preliminary training in the fundamentals upon which surgical diagnosis and judgment are based. After all, diagnosis and judgment are at least 90 per cent of the surgical game. It is a reflection upon the surgical profession that we have so many books on how to do certain types of operations and so few on diagnosis and judgment. You only need to look over the book shelves of any surgeon to tell whether he is a real surgeon or whether he is just an operator.

As stated earlier in the paper, the minimum standard for hospitals has done much for the improvement of our results, but it has much yet to do. The standardization scheme should require a yearly totalling up of the surgery for each hospital, as well as for each member of its staff who is doing surgery and a rating of them according to their end-results. If each member of the staff knew that his work was going to be checked over by an intelligent and unprejudiced committee together with a follow-up record of his cases for end-results, he would be stimulated to become a much better diagnostician and would be much less anxious to hurry people into operations.

The public should have some way of knowing what the ratings of the individual surgeons of the community are in the light of scientific investigation, instead of by hearsay or rumor from the public. As it is, it is often very hard for the ordinary intelligent man to find out who is the safest surgeon in his community. Any surgeon should be willing to stand on his results and for the truth about his work to be known.

Also, if a man's rating falls below a certain fair standard for his community, the hospital organization should be so constructed that it can limit him as to the type of surgery he is permitted to do in that hospital. In this way the public would be improved decidedly.

The methods used in some of our foreign countries would do much to improve our results, that is, by requiring an autopsy on every individual who dies. This autopsy would be done either by a competent pathologist under a government service or else one appointed by the medical organization and a complete diagnosis with microscopic findings would be made in each case. The attending surgeon as well as any other member of the licensed profession would be permited to witness the autopsy and receive a full written report of findings. Also, a report would be sent to the family so they would know what their relative died of. This would not only make our vital statistics of some real value but would put a check on the unscrupulous and untrained man, as well as the quack, and a premium on the able man of the profession.

EFFECT ON VISUAL ACUITY OF VIEWING MOTION PICTURES. More than 150 persons, university, college and high school students, and business men, were examined by A. Ray Irvine and M. F. Weymann, Los Angeles (*Journal A. M. A.*, Oct. 2, 1926), with reference to the effect on visual acuity of viewing motion pictures. The Ives apparatus for testing visual acuity gave constant readings, and is dependable as a measure for small variation of visual acuity. More fatigue was evident after forty-five minutes of reading current magazines than after viewing either a black and white, or a colored, motion picture for one and one-half hours, if visual acuity is used as a criterion for fatigue.

A CASE OF CARCINOMA OF THE TRANSVERSE COLON

H. D. JUNKIN, M.D.
IDAHO FALLS, IDA.

In this case report several points of unusual interest are noted. Cancer of the transverse colon usually presents early signs of obstruction. This patient had had little trouble with his bowels, and had continued his work up to the time of admission to the hospital. Second, very little distension had been noted. Third, no vomiting had occurred until the day before admission to the hospital. Fourth, the youthfulness of the patient, age 29, is quite unusual. (Dr. John Homans reported one case of carcinoma of the colon in a girl 23.)

Sixty-one cases of cancer of the large bowel, collected from the clinic of Dr. John Homans, Peter Bent Brigham Hospital, showed cancer of the cecum, 11 cases; of the ascending colon, 6; of the transverse colon, 12; of the descending colon, 6; of the sigmoid loop, 13; of the rectosigmoid, 13.

CASE REPORT

Male, age 29, occupation, battery repairman, came to my office on the morning of May 22, 1926, complaining of distress in lower abdomen. He stated that he had been having like distress for the past week; had been having fever; and had vomited twice. He thought he had had a similar attack three months ago. No time had been lost from work until the morning of May 22.

Examination. The patient is rather pale; walks stooped, and has an expression of pain. The temperature is 103° F., pulse 98; respiration 26. The eyes react to light and accommodation. No nasal obstruction. No adenopathy of neck. The tongue is coated; teeth good. Tonsils infected. Thyroid is negative. The chest is well formed. The heart and lungs are negative. The abdomen shows a definite mass just below the umbilicus. The mass is about 8.5 cm. by 8.5 cm., tender, and seems to be fixed. It looks very

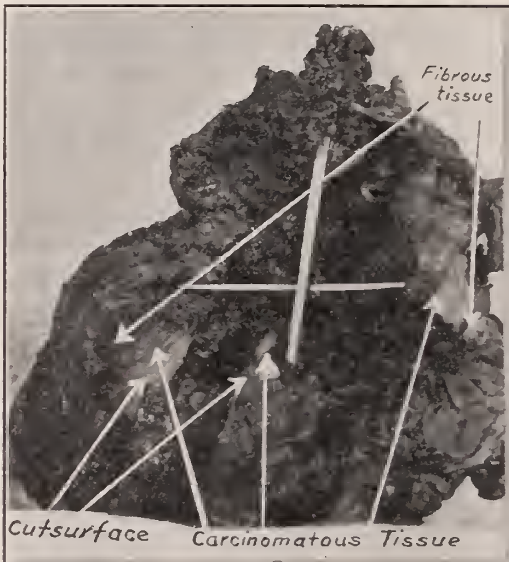

FIG. 1

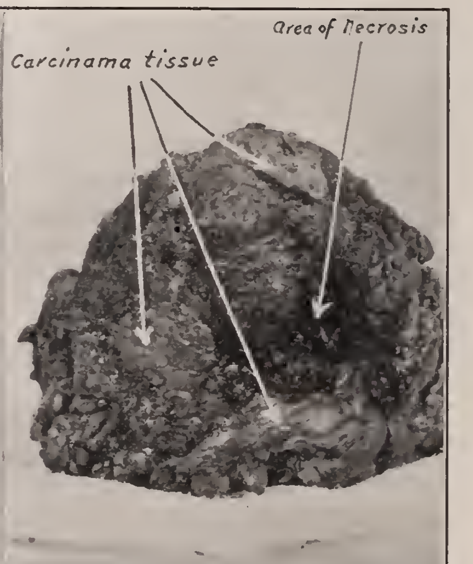

FIG. 2

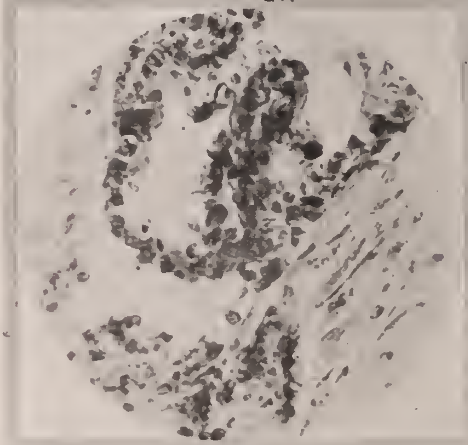

FIG. 3

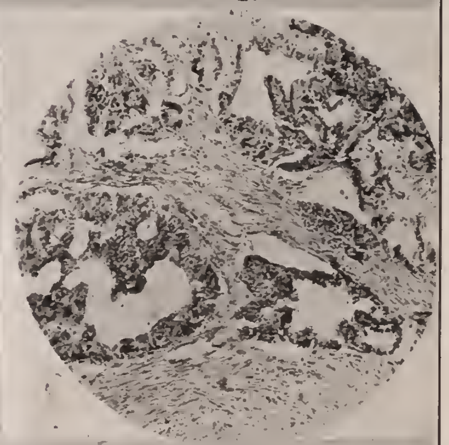

FIG. 4

much like a distended urinary bladder. The urinary bladder was catheterized and two ounces of urine obtained. The mass remained the same. The extremities are negative. Reflexes normal.

The patient was admitted to the Latter Day Saints Hospital at Idaho Falls at one p. m. the same day. The white blood count was 29,000. A provisional diagnosis of "inflammatory mass in abdomen" was made, and the abdomen opened. The mass was found attached to the anterior abdominal wall by inflammatory adhesions. After considerable difficulty it was delivered. It consisted of the greater portion of the transverse colon and was resected with the cautery knife. A goodly portion of the mesentery was resected with the mass. The ends of the colon were closed, the two tubes of the colon approximated with the cut ends toward the stomach, and a side-to-side anastomosis performed. The side-to-side anastomosis was chosen because a larger opening was thus effected and the sutures extending over a larger surface of the bowel offered more security from leaking than in the usual end-to-end anastomosis used in these cases.

Subsequent Course. The patient suffered extremely from hiccough for several days; vomited three or four times during the twenty-four hours for three days following the operation. The sutures were removed on the seventh day. Fecal drainage occurred on the fifth day and ceased on the twenty-first postoperative day. Normal bowel movements were established on the fifth postoperative day and have been normal since. The patient left the hospital June 21, thirty days after the operation.

The patient has had deep x-ray therapy over the abdomen, using 200,000 K. V. W. technic. He has gained fourteen pounds since his operation, and has been working since July 15. He has no trouble with the bowels and states that he feels better than he has for several months. The barium enema showed a satisfactory anastomosis.

The pathologic report is as follows: Preoperative diagnosis, inflammatory mass of transverse colon. Section of colon 15 cm. long which is densely thickened, walls in places being over 1 cm. in thickness. There is also a large necrotic spot about the size of a half dollar which opens into the lumen.

Micioscopically the walls show considerable fibrous tissue increase externally with considerable round cell infiltration towards the interior. There is a large amount of infiltration of large clear cells, assuming a glandular arrangement. The cells infiltrate widely, using the fibrous tissue present as the supporting stroma. There is also considerable degeneration among these cells.

Diagnosis: Degenerating adenocarcinoma of the intestine.

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PATHOLOGIC EXAMINATION IN CAVERNOUS SINUS THROMBOSIS. O. Jason Dixon, Kansas City, Mo. (*Journal A. M. A.*, Oct. 2, 1926), feels that his observation of septic thrombosis of the cavernous sinus seems to warrant the following conclusions: 1. Ordinary and trivial infections are usually the primary foci. 2. Some form of trauma is usually associated with these primary infections. 3. The thrombosis takes place by direct extension of the thrombophlebitis. 4. The offending organism is most frequently the staphylococcus.

RECENT ADVANCES IN THE PHYSIOLOGY OF GASTRIC AND PANCREATIC SECRETION*

A. C. IVY, M.S., PH.D., M.D.
CHICAGO, ILL.
Department of Physiology and Pharmacology
Northwestern University Medical School

In this paper I desire to outline the known causes and mechanisms of the gastric and pancreatic secretory response to a meal and to report briefly the recent advances that have been made by my colleagues and myself.

GASTRIC SECRETIONS

The gastric secretory response to a meal can be divided into three phases with reference to the site at which the stimuli are acting: (1) The cephalic phase, (2) the gastric phase, and (3) the intestinal phase.

THE CEPHALIC PHASE

It is well established that the sight, smell and taste of food in the presence of the appetite cause the secretion of gastric juice. The nervous impulses go to the stomach via the vagi. According to Zeliony, a decerebrate dog will secrete gastric juice on sham feeding. This proves that other than solely cerebral reflexes are concerned in the excitation of the gastric glands from the head region. It is certain, then, that the cephalic phase of gastric secretion is caused by (a) reflexes through the cerebral cortex (psychic), and by (b) reflexes through the thalamus, midbrain or medulla, the vagi being the sole pathway of these excitatory impulses.

THE GASTRIC PHASE

In order to study this phase without the introduction of complicating factors, we made a pouch of the entire stomach, reestablishing the continuity of the gut by a duodenoesophageal end-to-end anastomosis.

Mechanical Stimulation by Distension. We have found that when a balloon is placed in the pouch of the entire stomach and distended with from 150 to 300 c.c. of air, the gastric glands are caused to secrete after a latent period of from five to fifteen minutes. When this stimulus is applied for half an hour, from 20 to 50 c.c. of juice of high acidity is produced. The stomach of man also responds to distension, unless inhibitory factors are caused to operate.

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* Read before the Fifth Annual Meeting of Pacific Northwest Medical Association, Spokane, Wash., July 1-3, 1926.

Chemical Stimulation by Application of Substances to the Gastric Mucosa. We have applied the common foods to the gastric mucosa in quantities insufficient to stimulate mechanically. We found that meat or meat juice is the only common food substance that stimulates on local application to the gastric mucosa. Histamin and B-alanin are pure chemical substances that stimulate on local gastric application.

These observations show that the gastric phase of gastric secretion is caused by (a) mechanical distension of the stomach, and by (b) the action on or by way of the gastric mucosa of substances in the food.

The Intestinal Phase. When a dog with a pouch of the entire stomach and a duodenoesophageal anastomosis is fed a meal, two to four hours later the stomach begins to secrete copiously. If the meal is predigested, copious secretion begins within an hour. It is evident that in such an animal the food passes directly into the intestine from the esophagus. Therefore, the only way to account for the secretion is that it is due to the food or its digested products acting in the intestine.

Since distension of the intestine does not stimulate the gastric glands, we believe that the intestinal phase of gastric secretion is due to chemical substances in the food or, preferably, that arise from digestive or bacterial action in the intestine, which act on or by way of the intestinal mucosa.

Mechanisms. We are quite certain that several mechanisms are concerned in the secretion of gastric juice. These mechanisms are (1) secretory nerves, (2) increased blood flow, and (3) humoral agents.

Space does not permit a discussion of the evidence supporting the first two mechanisms, but we will consider the evidence proving a humoral mechanism.

A Humoral Mechanism for Gastric Secretion. We first attempted to prove a humoral mechanism for gastric secretion by blood transfusion and long-time cross-circulation experiments. These procedures did not yield satisfactory proof.

By a method described elsewhere we were successful in transplanting a pouch of the stomach under the mammary gland. We found that when the dog was fed, the transplanted pouch of the stomach secreted gastric juice. This proved unequivocally that when a meal is ingested something enters the blood stream that stimulates the gastric glands. This humoral agent must be either a hormone, or secretagogues, or both.

PANCREATIC SECRETION

The external secretion of the pancreas is without doubt the most important of the digestive secretions. Yet, less is known concerning the physiology of its production than of the physiology of the production of gastric juice.

We have been and are at present attempting to study and analyze the causes and mechanisms concerned in the secretion of pancreatic juice by methods similar to those we have used for the study of the secretion of gastric juice.

Our observations indicate that the pancreatic secretory response to a meal can be divided into two phases with reference to the site at which the stimuli are acting: (1) The cephalic phase, and (2) the intestinal phase, there being no gastric phase.

THE CEPHALIC PHASE

We have repeated and confirmed Pawlow's experiments on sham feeding a dog with a chronic pancreatic fistula. The amount of secretion that results from the sight, smell and taste of food is small, amounting to only 2 c.c. in fifteen minutes.

THE GASTRIC PHASE

To determine whether or not food or acid in the stomach causes the pancreas to secrete, we used a dog with a pouch of the entire stomach and duodenoesophageal anastomosis. A duodenal tube was passed by mouth into the duodenum for collecting the secretions. We found that when various substances (acid, fat, meat extract, water, etc.) were placed in the pouch of the entire stomach, no augmentation of flow of secretions from the duodenal tube resulted.

From these negative results we are led to believe that there is no gastric phase of pancreatic secretion.

THE INTESTINAL PHASE

There being no gastric phase and the cephalic phase being so small that it is not important, the intestinal phase of pancreatic secretion is the most important phase of the external secretory activity of the pancreas.

It has been definitely established that acids, neutral fats, fatty acids, soaps, proteins (meat, not egg white), starch, alcohol, and water stimulate external pancreatic secretion when introduced into the stomach so that they may enter the intestine.

How these substances stimulate has not been definitely ascertained. Several possible mechanisms have been suggested. These mechanisms are as follows: (a) These substances, on coming into contact with the upper intestinal mucosa, excite local reflexes to the pancreas which exert either a specific secretory influence on the pancreatic cells, or cause an increase in blood flow through the pancreas: (b) These substances either contain, or on digestion yield, secretagogues that stimulate either by local reflexes, or after being absorbed into the blood, by action on the pancreatic cells or their blood supply: (c) These substances, or secretagogues which might be present in them, on coming into contact with the upper intestinal mucosa, cause a hypothetical substance, "prosecretin," present in the cells of the mucosa, to be converted into "secretin," an alleged hormone, which passes into the blood and is carried to the pancreas and stimulates it, either by direct action on the cells or by causing an increased blood flow and capillary permeability. This is the mechanism that is commonly known as the Bayliss and Starling excretin theory: (d) These substances may effect the motility of the upper intestine which in turn, by reflexes or by an increase in blood flow, may excite the pancreas. Also a change in motility may play an indirect role by promoting the absorption of secretagogues or the passage of a hormone stored in the muscosal cells into the blood. Any one or all of these possible mechanisms must be considered in analyzing how any single substance excites the pancreas to external secretion when introduced into the intestine.

A Humoral Mechanism for Pancreatic Secretion. A humoral mechanism for external pancreatic secretion has not been established. However, work has been done which has suggested that such a mechanism does exist, at least for acid stimulation.

Recently we have devised a method for transplanting the entire tail of the pancreas subcutaneeously into the mammary gland. A two stage operation was employed similar to that used by us for transplanting a pouch of the stomach subcutaneously.

The transplant is entirely severed from its original blood and nerve supply. It receives blood only from the vessels that supply the mammary gland and closely adjacent structures. The transplant always takes, if a dog that has recently whelped or weaned pups is used in order to insure a vascular bed. As calculated from the amount of secretion that the transplant should theoretically produce, approximately fifty per cent of the gland transplant undergoes atrophy. But sufficient gland tissue remains to render this operation an ideal test object for the study of many problems related to both the external and internal secretory function of the pancreas.

Those transplants persist indefinitely. One is on hand now that was made twelve months ago. We (Farrell and Ivy) have removed the remainder of the pancreas and have found that the animal remains sugar free on a meat diet and that the carbohydrate tolerance, though less than normal, remains constant, constituting, we believe, a beautiful preparation for studies on problems related to diabetes.

Such a pancreatic transplant secretes a continuous secretion and is definitely excited to secrete after a meal, 6 c.c. of juice having been collected in one hour. This fact unequivocally establishes a humoral mechanism for pancreatic secretion, because the only manner by which the transplant could be so excited would be by substances carried to it via the blood stream.

This experiment does not reveal the nature of the substance, or substances, that gets into the blood. In other words, it does not show whether secretagogues in the food, or produced by digestion, are the exciting substances, or whether a hormone, or hormones, is responsible for the stimulation.

The Proof of a Hormone for External Pancreatic Secretion. Attempts have been made to demonstrate the presence of a hormone in the circulating blood of animals after the introduction of acid into the lumen of the intestine. Wertheimer and Le Page, also Fleig, collected the venous blood from the jejunum after the application of acid to the mucosa of the jejunum and injected it into another animal with the result that the animal's pancreas was caused to secrete. Enriquez and Hallion obtained a similar result from blood taken from the carotid. Popielski states that an increase of pancreatic can be elicited by the injection of blood from a nonsecreting or control dog. Matsuo obtained positive results in four out of eight experiments in which he did an acute carotid-to-jugular cross-circulation, obviously an unphysiologic type of cross-circulation. Luckhardt, using a syringe-cannula method, obtained negative results on cross-circulating a secreting with a nonsecreting animal. Recently Ivy, Lim and McCarthy have found blood transfusion and cross-circulation experiments inadequate for determining whether or not a humoral mechanism is concerned in gastric secretion.

We (Ivy and Farrell) have attempted to solve the problem by making the two following animal preparations: (1) A Thiry fistula of the jejunum was made in a dog that had a pancreatic transplant: (2) A twelve inch loop of intestine was transplanted under the skin of another dog and at a later date a pancreatic transplant was made.

It was found that when either N/10 or N/100 HCl was applied to the intestinal mucosa of the loop, the pancreatic transplant would secrete copiously within four to six minutes after beginning the application. In other words, the application of a pure chemical substances to the intestinal mucosa—food and cellular detritis absent—caused the mucosa to give off something, a hormone, to the blood stream which excited the cells of the pancreatic transplant to secrete. This, we believe, is the first unequivocal proof that a hormone may be one of the mechanisms concerned in the external secretory response of the pancreas to a meal.

It is still necessary for us to show that such a mechanism operates normally. That such a mechanism operates normally has been questioned recently by McClure and his associates on the evidence that the gastric chyme is rapidly neutralized in the duodenum and that the pH of duodenal contents varies from 3.0 to 8.0. This is not sufficient evidence to rule out entirely the possibility that acid chyme is causing the production of a hormone. Also, it must be kept in mind that acid chyme is being intermittently ejected into the duodenum—every three to ten seconds—and that there are brief periods, even though each period may be less than a minute in duration, of acid contact with the proximal duodenal mucosa, which when summed up may be sufficient to cause the production of a hormone.

Other Mechanisms. A hormone mechanism cannot explain all of the known facts of the causes of the intestinal phase of external pancreatic secretion.

Using the Thiry-fistula-pancreatic-transplant preparation referred to above, we have found that, when fresh olive oil is applied to the intestinal mucosa either no, or very slight amount of, stimulation of the transplant occurs. But, if we digest the olive oil with pancreatin for several days and then neutralize the acidity developed (fatty acids) and apply it to the intestinal mucosa, the pancreatic transplant secretes.

Since it is known that olive oil introduced into the duodenum of a pancreatic fistula dog stimulates within a period of time (five minutes), in which it would be unreasonable to assume that appreciable digestion would have occurred, it seems very likely that olive oil stimulates on contact with the mucosa by exciting local reflex mechanisms.

It should be clear from this brief discussion that several mechanisms are concerned in the causation of the intestinal phase of pancreatic secretion. A hormone is not the sole mechanism. Several mechanisms exist—factors of safety, if you please—that can arouse pancreatic secretion in achylia gastrica or in conditions in which the chyme ejected into the duodenum is not acid in reaction.

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CAUSES OF FAILURE IN TREATMENT OF PEPTIC ULCER*

John H. Fitzgibbon, M.D.
PORTLAND, ORE.

The interest of the medical profession in the treatment of peptic ulcer is shown by the voluminous literature on the subject. The large number of procedures recommended is ample evidence that no single type of management has proved satisfactory in a sufficient proportion of cases. Surgeons and internists are far from unanimous in support of any operation or dietary plan. Discussion of the relative value of medicine and surgery is frequent, and at times it appears to be a case of "medical versus surgical treatment" for ulcer. As a matter of fact, there is no single therapeutic procedure that will "cure" all peptic ulcers, the evident reason being that ulcers differ in duration, size, location, and associated complications, as well as their occurrence in individuals of various type, habits and occupation.

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* Read before Lane County Medical Society, Salem, Ore., Dec. 17, 1925.

It is also evident that the etiology is not the same in all cases of ulcer. If this is true, we cannot expect satisfactory results from applying any single method of treatment to all patients with ulcer. If surgery could offer a sufficiently large percentage of "cures," without recurrence or operative mortality, there would be no excuse for medical treatment, while, on the other hand, if medical treatment could do the same, there would be no call for surgery. There should be coordination between medicine and surgery in order that one may make up for the deficiencies of the other. No question of "medical versus surgical treatment" exists and harmonizing of methods for the best interest of the individual patient is to be desired. As both medical and surgical treatment have a certain percentage of failure and recurrence, it is well to attempt to discover and avoid, if possible, the common sources of trouble. The purpose of this paper is to discuss a few of the more common causes of failure of medical treatment, some of which may be overcome with resulting benefit to the patient.

Early diagnosis is invaluable, for acute ulcers or those of short duration generally respond well to medical treatment. It is regrettable that a number of ulcer patients are given temporary relief of distress, without alteration of their true condition, under diagnoses of "hyperacidity, gastritis, indigestion, etc.", and ulcers are allowed to progress undiagnosed. Too frequently we see ulcers of many years duration that have been treated under various diagnoses without adequate examination. As time passes, these often cause cicatricial obstruction, or deformity of the stomach or duodenum. Not uncommonly hemorrhage or perforation occurs. Thus lesions, that were originally simple, become complicated and treatment is more difficult.

The importance of a detailed history and examination in all patients complaining of abdominal discomfort cannot be overemphasized, for it is only by painstaking study that the percentage of early diagnoses can be increased. The idea that all ulcers may be readily demonstrated by an x-ray examination leads to careless history taking and shifting of responsibility for the diagnosis to the radiologist. A negative x-ray report does not always mean absence of ulcer, and clinical tests under observation are often necessary to verify the diagnosis.

Having made the diagnosis of ulcer, the question of etiology must be considered. Much has been said about focal infection as a cause of peptic ulcer, and there is sufficient evidence to make one believe that it is one of the important factors in many cases. It may be assumed that, if focal infection is a cause of ulcer, surgical removal or medical treatment without removing the cause is likely to be followed by recurrence. Routine examinations for and treatment of foci of infection should, therefore, be carried out in every case of ulcer. This, however, does not mean indiscriminate removal of teeth, tonsils and other removable parts.

Large deforming gastric ulcers of long duration are better treated surgically, because of the extent of scar tissue and possibility of malignancy. The latter must be considered and ruled out, if possible, by repeated examinations for occult blood in the stools. Ulcers that continue to bleed on accurate medical treatment are frequently malignant, and in doubtful cases an operation should not be postponed.

Painless duodenal lesions of long standing, associated with scarring and retention of gastric contents, usually do not respond to medical treatment, while painful lesions in this area, associated with spasm, inflammatory swelling and edema, generally show a marked response, even though retention is present. Sippy* has shown that between eighty and ninety per cent of all cases of pyloric obstruction, due to ulcer, will improve on accurate treatment, so that, at the end of three weeks treatment, a large motor meal will pass in normal time (seven hours). This does not mean, however, that the condition is "cured" in that length of time, but that spasm, inflammatory swelling and edema subside, and the pyloric outlet is opened sufficiently to allow the stomach to empty within normal time.

In many cases a deformed outlet remains, but an hypertrophied gastric musculature is able to compensate for the remaining stenosis of the outlet. Many of these individuals will show still further improvement on continued treatment. It is well to test out doubtful cases of this type by a period of medical treatment, in order to see if they will respond medically. If the response to treatment is not satisfactory, the situation should be explained to the patient and surgery advised, provided there are no contraindications.

After a decision is made in favor of medical treatment, one must not forget that patients are individuals, each having his own peculiarities and variations which must be looked into and cared for, if treatment is to be successful. No system of treatment can be applied to all alike, and no matter how standardized a therapeutic procedure may be, it can not affect all patients in the same way, because of individual variations and complications. It is too commonly assumed by members of our profession that the Sippy treatment is a routine method, applied to all alike. Nothing could be further from the truth, and it has been repeatedly stated by the originator of the method that success depends upon accuracy in controlling individual variations. It is easy to lose sight of this idea of accuracy and individual control, and render the treatment inadequate and unsuccessful by so-called modifications, which relieve symptoms but seldom give permanent results. Unfortunately, the distress of ulcer is easily relieved and many are misled into believing that relief of pain means healing of the lesion. Practically all chronic ulcer patients have periodic relief from distress for weeks or months at a time. As a result, both physician and patient may assume that the condition is cured until the distress returns at a later date.

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* Sippy, B. W.: Ulcer of the Stomach and Duodenum, Oxford Loose Leaf Medicine, Vol. III, Page 160.

Ambulatory treatments, as a rule, do not obtain the best results, and regardless of the type of treatment used, results are much better if the management is started with a period of bed rest. When the Sippy method is applied, rest should be for three or four weeks, preferably in a medical institution equipped with proper laboratory facilities. If the details of treatment are carefully carried out, the patient learns the necessity for accuracy, and will more readily do his part. It is advisable to "educate the patient" by explaining various phases of the treatment, in order that he may intelligently cooperate. Short periods of treatment give only temporary relief, as a rule, and it is necessary to encourage patients to continue for the prescribed length of time. This is done by careful instruction and frequent examinations to note progress.

One of the most common difficulties met with in medical treatment of ulcer is the complication known as "continued secretion," in which, as a result of irritation of the gastric glands by retained contents, an abnormal amount of highly acid gastric juice is poured out during the evening and night hours, even though the stomach is empty of food. If the peptic action of gastric juice, causing digestion of healing granulations, is one of the factors which prevent chronic ulcers from healing, it is not difficult to imagine that healing gained during the day may be undone by excessive night secretion. Controlling this complication will allow many additional hours of rest for the diseased stomach or duodenum. Many patients who have night distress have this condition and, if the stomach contents are aspirated at the time of distress, an abnormal amount of highly acid contents will be removed, followed by relief from distress.

"Continued secretion" is frequently undiagnosed, because it is not looked for. It can be easily discovered by removing the stomach contents early in the evening and again about three or four hours later, without the patient receiving food or medication between aspirations. An abnormal amount of contents at the second aspiration shows that excessive secretion exists. It can be controlled within a few days by accurate neutralization and removal of irritating gastric contents. In this connection it is well to mention the fact that accurate control of an ulcer treatment can not be obtained without use of a stomach tube. The inconvenience is more than compensated for by knowledge gained and results obtained.

In jejunal ulcer developing after gastroenterostomy, poor results at times follow medical treatment. This may be due to the fact that trypsin is a powerful proteolytic ferment which is not influenced by controlling gastric secretion. Healing granulations are digested away, even though peptic action is stopped. These are perhaps, to a certain extent, tryptic ulcers.

Failures occasionally result in individuals who develop toxic symptoms while taking alkali. Loss of appetite and headache are the warning signs and disappear rapidly when medication is stopped. A blood chemistry examination will generally reveal an increase in urea nitrogen or plasma bicarbonate. Many patients who have difficulty in handling alkali show evidence of kidney impairment or have a past history of kidney disturbance. Hypertension may be present, and has been noted to increase while taking alkali. Alkaline management should not be continued in patients who show toxic symptoms, for if continued in spite of the warning signs, tetany may result. It must also be remembered that pyloric obstruction associated with vomiting sometimes causes alkalosis and gastric tetany by depletion of body acids. If additional alkali is given, the result may be distastrous. Fortunately those who develop toxic symptoms are not commonly seen, and when watched for may be prevented from developing serious symptoms.

Stevens Building.

CLINICAL AND ROENTGENOLOGIC FINDINGS IN THREE HUNDRED AND THIRTY-TWO ORGANIC GASTRIC LESIONS*

Maurice F. Dwyer, M.D.
John M. Blackford, M.D.
SEATTLE, WASH.

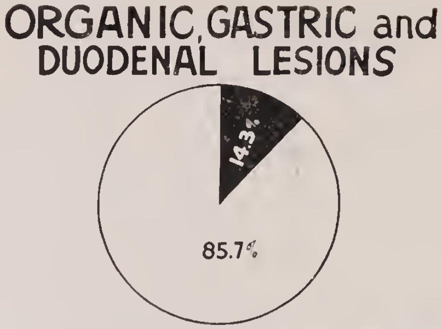
In a study of 2225 consecutive histories of patients complaining of gastric symptoms, 332 or 14.3 per cent received a diagnosis of organic gastric lesions (fig. 1). Approximately 10 per cent of the total number of patients entering our clinic require a gastrointestinal examination.

Each patient in this series has received a careful routine examination. Such an examination includes clinical history, physical examination, roentgen gastrointestinal study, the usual routine laboratory tests, and other roentgen and laboratory examinations when indicated. The final diagnosis on each patient has been reached only after a careful correllation of all clinical and roentgen evidence.

The 332 diagnoses of organic gastric lesions comprise 221 duodenal ulcers, 66 gastric cancers, 41 gastric ulcers, 2 gastric syphilis, 1 gastric sarcoma and 1 gastric hairball, making 14.3 per cent of the patients complaining of gastric symptoms. Extragastric conditions are by far the chief causes of stomach trouble. In 80 per cent of this series the stomach was found not to be the primary cause of the dyspepsia. Gallbladder disease is in our opinion the most common cause of stomach symptoms; 20.4 per cent of the entire series received such a diagnosis, equaling the total number of organic and functional diseases of the stomach and duodenum (fig. 2).

Duodenal ulcer is the most frequent lesion of the stomach or duodenum causing gastric symptoms, and comprises 68 per cent of the organic gastroduodenal lesions and 9.9 per cent of the total series. In our experience, the average age of patients suffering with duodenal ulcer is forty-one years of age. Nearly 50 per cent stated that the onset of their present gastric disturbance began before the age of twenty-five, and 25 per cent before the age of twenty (fig. 3).

The study of this comparatively common lesion shows that a carefully obtained clinical history and properly interpreted roentgen findings are the two salient factors in the diagnosis of duodenal ulcer.


ORGANIC, GASTRIC and DUODENAL LESIONS

332 OR 14.3% OF 2250 PATIENTS COMPLAINING OF GASTRIC SYMPTOMS HAD ORGANIC LESIONS IN THE STOMACH AND DUODENUM

Fig. 1.

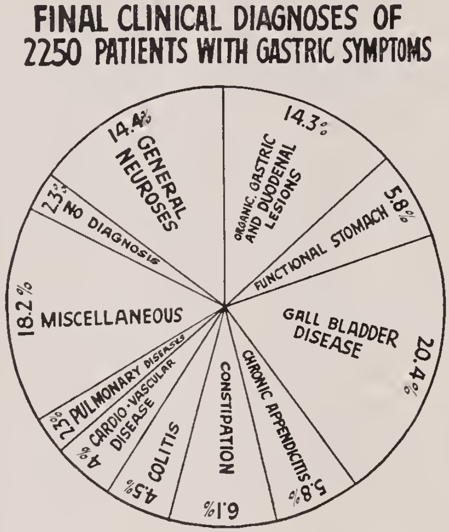

FINAL CLINICAL DIAGNOSES OF 2250 PATIENTS WITH GASTRIC SYMPTOMS

Fig. 2.

TYPE OF ULCER	AVERAGE AGE AT TIME OF DIAGNOSIS	PERCENTAGE SEEKING RELIEF BEFORE 45 YRS. OF AGE	PERCENTAGE DATING DIGESTIVE DISTURBANCES BEFORE 25 YRS. OF AGE	PERCENTAGE DATING SYMPTOMS BEFORE 20 YRS. OF AGE
DUODENAL	41 YRS.	66%	50%	25%
GASTRIC	48 YRS.	33%	25%	4%

Fig. 3. Comparison of duodenal and gastric ulcers in relation to age of patient at onset of symptoms.

It is relatively rare for the roentgenologist to demonstrate an ulcer without at least a very suggestive history and, conversely, the roentgen report when returned to the clinician seldom disappoints him if he has sufficient clinical evidence to suspect strongly the presence of an ulcer.

The final clinical and x-ray diagnosis agreed in 94.9 per cent of the proven cases. It has been our experience that, generally speaking, an error in x-ray diagnosis has also been an error in the final clinical diagnosis which, however, is never made until the roentgen report has been submitted and the findings of all departments correlated.

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* Read before the Thirty-seventh Annual Meeting of Washington State Medical Association, Spokane, Wash., June 28-30, 1926.

The tentative diagnosis had on several instances been changed on account of the roentgen report and the medical department in arriving at the ultimate diagnosis had reversed the roentgen diagnosis in only 4.6 per cent. The roentgen findings in the diagnosis or elimination of organic gastric disease in this series have practically always been accepted by the clinicians. The 20 per cent of the duodenal ulcer patients presenting an indefinite story could not conservatively have received a diagnosis of ulcer, were it not for the roentgenologist. The diagnosis in those cases giving so-called typical histories was greatly fortified by confirmatory roentgen evidence.

The percentage of final agreement by the clinician and roentgenologist in the diagnosis or exclusion of gastroduodenal pathology depends upon the relative standard of proficiency of both. When frequent disagreements occur, it can only mean that one is comparatively more versed in gastroenterology than the other. The more patients a clinician or roentgenologist sees complaining of stomach trouble, and the greater the opportunity they each have for a surgical check on their diagnosis, the more convinced each will become of the necessity of obtaining a good clinical history before attempting the differential diagnosis of gastric symptoms. Such a history cannot be hurriedly obtained, nor should it be delegated to a minor assistant, as the amount and value of the information obtained from a history depends upon the caliber of the one taking it. If a competent roentgenologist is not available, it is better for all concerned to dispense with such an examination and depend upon the history and clinical findings alone, as the haphazard x-ray study of the gastrointestinal tract is worse than none at all. Such an examination at the best will only tend to confuse the clinician.

X-ray diagnosis is the subjective interpretation of objective findings. Unless the examiner has had considerable experience, unless he has correlated a large amount of clinical and x-ray evidence and has followed his patients to the operating room, he will encounter many pitfalls. He must be a physician practicing roentgenology and not a technician, the proud possessor of glistening x-ray equipment. Realizing the comparative accuracy of the roentgen diagnosis of diseases of the gastrointestinal tract when properly conducted and the necessity of considerable knowledge of clinical medicine on behalf of the examiner, it is, to say the least, difficult to understand how some doctors of medicine refer patients to lay laboratories. Ignorance of roentgenology and clinical medicine in general must be the answer.

The so-styled typical history of duodenal ulcer was found in 80 per cent; 20 per cent gave suggestive histories, and it is in this group that the roentgenologist plays the most important role, for without him demonstrating an ulcer the clinician would be unable to arrive at a definite diagnosis. A good clinical history of duodenal ulcer is seldom misleading but not all ulcers give such a history and occasionally a diseased gallbladder or appendix may closely simulate that of ulcer.

Gastric analysis as commonly employed is of little help to the clinician. The average free hydrochloric acid in the series was 40, the average total acidity being 54. The lowest free acidity, not including a few showing total absence of acid following hemorrhage, was 12. History of massive hemorrhage occurred in 31 or 15 per cent and acute perforations in 11 or 5.3 per cent. Seven out of 11 perforated duodenal ulcers were found before the age of 45.

The chief sign in the roentgen diagnosis of duodenal ulcer is the persistent deformity of the duodenal bulb. Such a deformity found on reexamination, or after the administration of an antispasmodic to full physiologic effect, practically always means ulcer. A duodenal bulb of normal contour can safely be assumed as denoting no ulcer. It is true that a few cases of duodenal ulcer presenting a normal bulb have been reported, but for all practical purposes these exceptions can be disregarded. However, not all irregularities of the bulb found on a single examination signify ulcer. The various reflex disturbances may cause bulbar deformity and unless the roentgenologist is constantly on his guard many such deformities will be misinterpreted as denoting ulcer. Reflex pylorospasm not infrequently will prevent the examiner from completely filling the first portion of the duodenum, thereby preventing him from excluding the presence of an ulcer. Tincture of belladonna, given to the full physiologic effect, will overcome this apparent obstacle. We have employed this as a routine method for the elimination of extrinsic spasm for several years, and have as yet not the slightest reason to do otherwise. We are confident that many more errors in diagnosis would have been made, had we failed to do so.

Gallbladder disease may cause duodenal deformity, but we believe that only a very small percentage cannot be finally differentiated from the deformity due to ulcer. Adhesions from the gallbladder to the duodenum may be a source of error. It is relatively common for the surgeon to find adhesions from gallbladder to duodenum, but it is also very uncommon for the roentgenologist to note duodenal deformity due to adhesions. Of the four positive x-ray errors in this series, the fundus of the gallbladder was found adhered to the duodenum in one instance and a diseased appendix accounted for the error in the remaining three.

Two of the patients, in whom the appendix and not ulcer was the cause of the gastric symptoms, presented such typical ulcer histories and x-ray findings that the question of reflex disturbances as a cause of bulbar deformity was not considered. One of these patients has been relieved of his symptoms by appendectomy. The other still complains of stomach trouble. We believe that a roentgenologist should in practically all cases, right or wrong, state that in his opinion there is or is not an ulcer, and not enter into a long discussion and conclude his report by stating that the duodenum, gallbladder or appendix may be at fault. Reexamination, the use of antispasmodics and the newer methods of gallbladder examination will usually differentiate these conditions.

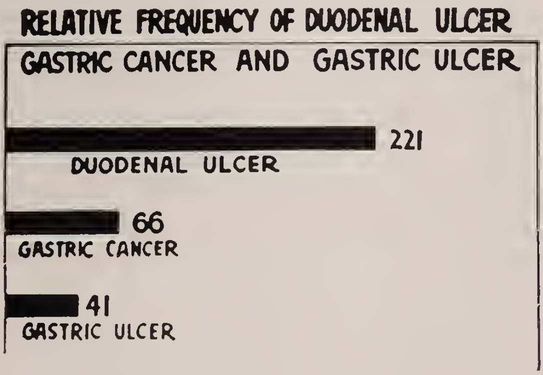

Fig. 4.

To err is human and he who has not made an occasional error has had few patients to examine or has failed to follow his patients to the operating room. Nevertheless, the clinician expects and the roentgenologist should, in a very creditable percentage, differentiate these conditions.

Gastric ulcer was diagnosed 41 times in this series, comprising 12.4 per cent of the total organic gastric lesions and was practically one-fifth as common as duodenal ulcer (fig. 4). The average age at the time diagnosis was made was forty-eight. In comparing the histories of gastric and duodenal ulcer patients, it was interesting to note that only one-third of the gastric ulcer patients sought relief before forty-five years of age, one-fourth before twenty-five years, and 4.5 per cent stated that their stomach bothered them before the age of twenty. Gastric ulcer in comparison with duodenal ulcer is essentially a disease of older people. Seventy-five per cent date the beginning of their trouble after the age of twenty-five. No definite attempt has been made to differentiate benign and malignant ulcers, although, when considering the age of the patient at the onset of symptoms and the size of the crater, several have been considered as malignant but classified as ulcer.

The clinical differentiation between gastric and duodenal ulcer is difficult, as many gastric ulcers are atypical and present an indefinite history. Here the roentgenologist localizes the lesion and gives added accuracy to the diagnosis and occasionally will establish the presence of an ulcer, when the clinical signs and symptoms are very inconclusive. By far the largest percentage of gastric ulcers occur along the lesser curvature, extending slightly on the posterior wall. If these ulcerations are more than mucosal erosions, their direct presence will generally be recognized. It must be remembered, however, that approximately 16 per cent of gastric ulcers are located on the posterior wall, a considerable distance from the curvature, and unless the roentgenologist is constantly on his guard and suspects the presence of an ulcer, many will easily be overlooked.

Examining the patient in the oblique and recumbent positions will occasionally demonstrate an ulcer crater not seen in the erect and dorsoventral view. A few years ago Carman called attention to a newer method of examining the posterior wall of the stomach. This consists chiefly of the close observation of the path by the barium meal as it enters the stomach, the palpation of the partially filled viscus in order to determine the presence of a crater on the posterior wall, and the visualization and course of the sulci between the rugæ.

The large majority of posterior gastric ulcers are found in the middle third of the stomach, and approximately one-fifth are located in the upper third. It behooves the surgeon when exploring the stomach to carefully examine the upper posterior third of the stomach. We have record of one case of high posterior ulcer not diagnosed by the roentgenologist and overlooked at surgical exploration only to perforate and cause death a few weeks later.

Sixty-six patients in this series suffered from cancer of the stomach. Next to duodenal ulcer cancer is the most frequent organic lesion of the stomach and duodenum. Three per cent of gastric symptoms in general and 20 per cent of organic gastroduodenal lesions were found due to cancer. No diagnosis in medicine is more depressing to the patient and physician than gastric carcinoma, especially when over 50 per cent are inoperable at the time the diagnosis is made. An early diagnosis of the disease is absolutely necessary, if we are to offer these patients any hope.

Of recent years the number of five-year surgical cures are increasing, due entirely to greater diagnostic ability and the education of the people near the cancer age to consult a physician at the first sign of stomach trouble. The physician must never casually dismiss the patient of middle life complaining of gastric symptoms, and particularly if the onset of digestive disturbances occurs in a previously healthy man. All such cases are entitled to and must receive a careful detailed study. The physician himself is occasionally a cause for the late recognition of gastric cancer. Nevertheless, at the best the gain in the number of operable cases, owing to the nature of the disease, will be comparatively small. It is a disease that often gives but few symptoms until it is far advanced, and the majority of cancers of the stomach are so located or of such a nature that early metastasis is the rule.

A review of the histories of our cancer patients have brought out some well-known facts. Cancer has apparently originated in 80 per cent of our patients in a resectable part of the stomach. One of us* in reviewing this subject clinically a year ago, noted that early pyloric obstruction has been a fortunate complication because it has brought the patient in early for relief.

Approximately one-third of our gastric cancer patients have had a previous possible or probable ulcer history. Seventy-five per cent of these ulcer-cancer patients have free HCl present, some in excess of normal. The two-thirds without a suggestive preulcer history presented no case with free HCl.

Practically all patients presenting short histories have developed marked evidence of disease when consulting us. The history of early cancer of the stomach is very indefinite and the so-called text-book symptoms of cancer should not at present concern us. The roentgen determination of the presence or absence of cancer of the stomach so far supercedes all other known methods that such examination should never be undertaken without it. Without the x-ray we would be compelled to revert to the old methods of depending on cachexia, loss of weight, tumor obstruction, etc., which are all signs of advanced gastric cancer. We know of only two roentgen errors in the diagnosis or exclusion of gastric cancer in the series, an apparent x-ray diagnostic accuracy of 96.9 per cent. The eliminative value of the x-ray in excluding gastric cancer is of greatest assistance to the clinician and often requires more skill on the part of the roentgenologist than in arriving at a positive diagnosis.

Eight patients have consulted us on account of an erroneous roentgen diagnosis of cancer elsewhere. Careful study showed the diagnosis erroneous in all these, and operation proved it in six cases. Pernicious anemia with an apparent filling defect due to spinal pressure accounted for the remaining two. Reexamination of doubtful cases, especially after eliminating extrinsic spasm, will decrease the percentage of negative errors.

We believe there is no excuse for the x-ray diagnosis of cancer in a normal stomach and such was one of our own errors, made in 1918. Failure to examine the patient in the prone position not infrequently accounts for overlooking a cancer of the cardiac end of the stomach.

SUMMARY

1. Fourteen per cent of patients complaining of gastric symptoms have organic lesions in the stomach or duodenum.

2. Gallbladder disease is the most common cause of dyspepsia, 20.4 per cent of the total series of gastric complaints receiving such a diagnosis.

3. Duodenal ulcer accounted for the symptoms in 9.9 per cent, and is the most frequent organic lesion of the stomach or the duodenum. Approximately 50 per cent stated that their gastric disturbance began before the age of twenty-five.

4. Eighty per cent of duodenal ulcers in this series gave the so-styled typical history. Twenty per cent presented an indefinite story and could not conservatively have received a diagnosis of ulcer, had it not been for the roentgenologist. The final clinical diagnosis in the group that gave definite histories of ulcer was greatly fortified by confirmatory roentgen.

5. Gastric ulcer is one-fifth as common as duodenal ulcer, and occurs in relatively older people.

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* Blackford, J. M.: Gastric Carcinoma. Northwest Medicine, June, 1925.

Seventy-five per cent date the onset of their digestive disturbances after the age of twenty-five.

6. Sixteen per cent of gastric ulcers are located on the posterior wall. Unless the roentgenologist carefully examines the posterior portion, many will be overlooked.

7. Cancer of the stomach comprises 20 per cent of organic gastroduodenal lesions. Three per cent of gastric symptoms in general are due to cancer.

The roentgen ray is by far the most important method we possess in the diagnosis or exclusion of gastric ulcer. All other means of examination are of secondary importance.

8. Every patient past the age of forty who complains of stomach trouble, especially if the digestive disturbances occur in a previously healthy man, must have careful x-ray examination to diagnose or exclude early cancer. Great injustice is done the patient, if an inoperable carcinoma is discovered at a future date.

9. A carefully obtained clinical history is of the greatest importance in the differential diagnosis of general gastric symptoms, and too much time cannot be spent in obtaining it.

10. The roentgen examination is the most important factor in the diagnosis of organic lesions of the stomach and duodenum.

THE ORIGIN OF BILE PIGMENTS AND COLORLESS (WHITE) BILE

THE PROGNOSTIC IMPORT OF THE LATTER

Wayne J. Stater, M.D.
PORTLAND, ORE.

Not very long ago the liver was accredited with the function of production of bile pigment from hemoglobin, but recent studies[7, 10, 11, 15, 20] have clearly demonstrated an extrahepatic origin of bilirubin. The liver cells, not including the Kupffer cells which are members of the reticuloendothelial system, function chiefly as organs of excretion[10, 14, 15] for the bile pigments. The demonstration that bile pigment is found in the blood stream normally, and the presentation of the van den Berg test for the quantitative estimation of bilirubin in the body fluids question the theory that the bile pigments are formed in the epithelial hepatic cells.

The demonstration of the extrahepatic formation of bile pigment has been most convincing. Whipple,[20] by experiments in which the liver was excluded from the circulation, was led to believe that the bile pigments are formed largely outside the liver. Mann, Bollman and Magath[11] showed a continued formation of bile pigments after hepatectomy, and the amount of pigments formed is similar to the amount produced after cholecystectomy and ligation of the common duct. These investigators reached a similar conclusion that the liver is not essential to bile pigment formation but should be considered as an excretory organ for bilirubin.

Rich[15] observed the formation of bile pigment in dogs after removing the liver but leaving the musculoskeletal system within the circulation. He concluded that bile pigment can be formed outside of the liver and may be so formed normally. He finds no evidence that the epithelial liver cell is able to produce bile pigment but believes that the evidence shows that this type of cell only excretes the pigment brought to it by the blood stream. Mann, Bollman and Magath have further shown that bilirubin is formed in the body even after the surgical removal of all the intraabdominal organs, which gives further proof of the extrahepatic formation of bile pigments. While it does not exclude the abdominal contents from this function, it indicates that other tissues outside the abdomen have the function of bile pigment formation.

It has been known for a long time that the cells of the reticuloendothelial system have a phagocytic function. Rich[14] has presented facts which show that these cells can form bile pigment, although this evidence is not complete. But he was unable to find any other type of cell that can form bilirubin, and he does not believe that these pigments can be formed by enzyme action extracellularly. The cells that make up the reticuloendothelial system, that is, the Kupffer cells of the liver, the phagocytic cells of the spleen, bone marrow, and lymph glands, the clasmocytes of the connective tissue and the large mononuclear cells of the blood can be seen phagocytizing red blood cells under both normal and pathologic conditions. By application of microchemical stains it can be shown that these cells have the function of breaking down the red blood cells into simpler compounds. Mann, Sheard, Bollman and Baldes[10] have shown that bilirubin is added to the blood as the latter passes through the spleen and bone marrow. Most of the other tissues of the body except the liver were similarly studied. It was found that bilirubin was not added to the blood while passing through any of them.

The bilirubin content of the arterial and venous blood was measured by the spectrophotometer. It is held by investigators of this problem that the Kupffer cells of the liver which form a fair proportion of the reticuloendothelial system are able to form bilirubin, and this is also true of the lymph nodes. Thus the liver, bone marrow and spleen would be the chief loci of bile pigment formation. It is probable that different parts of the reticuloendothelial system vary in their ability to form bilirubin. The evidence indicates, then, that the bile pigments are formed by the reticuloendothelial system and that the epithelial hepatic cell acts only as an excretory organ. The bile pigment so formed is given to the blood plasma, where it is carried to the liver and excreted into the bile. It is the presence of these pigments which give bile its characteristic color.

The color and character of the bile formed in the gallbladder and ducts after operation present a varied appearance and the clinical study of this bile as well as of normal bile has thrown some light upon lesions in this system. The color of the bile is influenced by infection, intermittent or permanent obstruction of the ducts, and by certain hepatic intoxications,[3] such as chloroform poisoning. Rous and McMaster[16] have shown, when obstruction occurs, the color of the bile that results depends upon whether the obstructed duct or ducts are in communication with a normally functioning gallbladder. If the obstructed duct remains in connection with a normally functioning gallbladder, the bile remains pigmented, the color and character of the bile depending upon the length of the period of obstruction. In the beginning the gallbladder concentrates the obstructed bile which turns a greenish black color after a few days, and tarry and jelly-like after a few weeks, due to a progressive biliary concentration and conversion of bilirubin into biliverdin. This change is most marked in the gallbladder but also occurs in the connecting ducts. The gallbladder adds its secretion to the concentrated bile. This addition tends to increase the concentration, while the thin secretion from the ducts tends to dilute the bile. The final result is a gradual replacement of the bile by the gallbladder and duct secretions.

If the obstructed duct is not in connection with the gallbladder or is in connection with a badly diseased gallbladder, the results are entirely different. The stagnant bile, at first brown, turns green after the stasis has persisted for about ten days or longer, and finally becomes a pale yellow or entirely colorless, even when the subject is deeply jaundiced. This change of color is due to a replacement of the bile by a colorless secretion of the ducts which occurs in spite of an increased pressure in the ducts sufficient to produce dilatation.

The bile escapes from the obstructed ducts but the exact locus where this occurs is not known except that it is near the margin of the lobuli of the liver. Most investigators in this field believe it to occur at the junction of the intralobular bile capillaries with the collecting channels of Glisson's capsule.

"White bile" is the colorless fluid found in the bile ducts under certain conditions. It may be formed in two distinct ways. It arises as a secretion of the glands of the ducts after obstruction of ducts which are not in connection with a normally functioning gallbladder. It may also arise from the epithelial hepatic cells as a result of hepatic intoxications, such as chloroform poisoning as shown by Drury and Rous.[3] The "white bile" which arises in this way may come from the parenchymal cells of the liver which may be able to excrete a clear, white fluid, the bile pigments and other constituents of the bile being suppressed.

"White bile" has been found in the bile ducts of human beings when the obstruction was due to stone, pressure from without obstructing the common duct, stricture of the common duct, carcinoma of the ampulla of Vater or head of the pancreas, pancreatitis, and probably in cholangeitis. In animals "white bile" was produced experimentally by Rous and McMaster[16] by obstructing the common and cystic ducts at the same time, by obstructing one or more of the hepatic ducts, and by isolating a portion of the common duct by ligating and cutting it proximally and distally. The animals became jaundiced but the fluid in the ducts was found to be clear after varying periods of time. Cultures of the fluid showed no growth.

"White bile" was produced in animals after prolonged chloroform anesthesia by Drury and Rous. When the animals were examined, there was no evidence of obstruction either in the large or small bile radicals. Apparently an acute suppression of bile occurred but a thin, white fluid was secreted, in which bile pigments, salts and cholesterol were not demonstrable. When "white bile" appears as a result of basic liver injury, the liver is apparently unable to excrete bilirubin from the blood, just as the kidneys are unable to excrete urea under certain circumstances. The inability of the liver to excrete bilirubin following chloroform poisoning is not due to a lack of pigment formation in the body. There is an increased blood destruction with the probability of increased pigment formation.

Judd[9] states that "white bile" is a misnomer. In my opinion this may not always be true. When the term "white bile" is applied to the colorless fluid occasionally found in the obstructed common and hepatic ducts, it is a product of the glands of the duct wall and in that instance may well be called a misnomer. But when it arises as a result of basic liver injury, it may come from the hepatic parenchymal cells and is then in no wise a misnomer. The origin of this thin, white fluid remains to be determined. The part played by the parenchymal cells of the liver and the glands of the ducts has not been clearly demonstrated.

The presence of "white bile" in the ducts is generally considered as an additional operative risk. The prognosis, however, depends somewhat upon whether it is the result of an obstruction or basic liver injury. In the case of obstruction the liver may not be more greatly affected than in any deeply jaundiced patient. But if the "white bile" is the result of basic liver disease, the prognosis is more grave. In this instance it is in my opinion analogous in its origin to the "white bile" found in chloroform poisoning in animals, and it should always be regarded as a grave prognostic sign.

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THE COLON

THE MOST ABUSED ORGAN OF THE BODY*

I. H. Moore, M.D.
SEATTLE, WASH.

INTRODUCTION

In the narrow limits of this paper it will be impossible to present my subject with any degree of thoroughness. I only hope to give the interpretations of facts well known, but oftentimes forgotten, from a medical standpoint with brief references to the surgery of the colon. Largely I desire to present some practical ideas of vital interest to the most useful man in the world, the choicest gem of civilization, the general practitioner. "Let us talk it over, boys," is the spirit and desire of my thought rather than a broadside of fireworks from a specialist's bewildering technicalities.

You are wise men and women, if you understand your colons and keep them in perfect working order. Mental rest, health, happiness, vigor and long life are the gifts which an *active* colon gives you, and a *lazy* colon takes from you. The colons of civilized races are poor unfortunate cripples, out of shape, contracted or dilated, stretched, infected, inefficient, twisted, kinked, incompetent and paralyzed. The colon is the worst abused organ of the body, a condition largely preventable, ourselves to blame.

The colon is your sewerage system, but by neglect and abuse it becomes a cesspool. When it is clean, you are well and happy; let it stagnate and it will distill the poisons of decay, fermentation and putrefaction into your blood, poisoning the brain and nervous system so that you become mentally depressed and melancholic, irritable and restless; it will poison your heart so that you are weak and listless; poison your lungs so that your breath is foul; poison your digestive organs so that you are bloated, belching and distressed with gas pains; poison your blood so that your skin is sallow, blotched and unhealthy. In short every organ of the body is poisoned and you age prematurely, look and feel old, your joints are stiff and painful; neuritis, arthritis, dull eyes and sluggish brain overtake you; the pleasure of living is gone.

Thanks to such men as Case and other roentgenologists, we are given a look inside, and the depravity of the colon is revealed, showing it to be afflicted with more serious ailments than any other organ of the body. Sixty per cent of the diseases which have for ages been a mystery and the cause undiscovered are due to poisons generated in the colon.

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The profession and the public press are advocating yearly physical examinations and it certainly is a wise procedure. How pitifully few who follow this examination custom have a colon and rectal invoice made. Whose fault is it? Theirs or ours?

THE TWO ORIFICES

If we desire to melt pathology back into normal anatomy and reestablish normal activities and functions, we must consider and study two great orifices, the mouth and the rectum. Our profession was called into existence because man violates all principles of common sense and natural law in his unscientific and indulgent use of foods.

A small percentage of people have a normal rectum. A spastic sphincter will lower the vitality of the whole body. It inhibits the free passage of feces and the constipation resulting reacts on the peristaltic action of the bowels.

The incubation period of rectal troubles and the extended lesions often is ten to fifteen years, which shows the slight attention given this end of your anatomy. Early attention to the diseases of the anus and rectum is more important than that given to the eyes and teeth. Rarely does a child escape attacks of inflammation of the anus and of the mucous membrane lining the anal canal. This is shown by skin tabs or circle of elongated integuments around the orifice in later years. Why do you have fistulas, abscesses, proctitis, sigmoiditis etc.? The answer is simple—because of years of neglect.

Physiologically the rectum is a conduit. Should feces pass into the rectum and the reflex be not responded to, they will be returned to the sigmoid. When the rectum's functions are disturbed, it simply becomes a pouch and a receptacle for feces and is not physiologically empty but pathologically distended, the result of spasticity of the sphincter ani. This accumulation at the end of the intestinal sewer becomes a source of infection. The action of cathartics fills this dilated pouch with foul watery substances readily absorbable. The pathologic changes resulting from rectal impaction may be expected and are due to extend to the sigmoid. A healthy action of the sigmoid depends on the rectum, and as rectal diseases are so universal, it is inevitable that fecal matter will be dammed up in the sigmoid with its constipation and host of disturbances.

The colon is a conduit and physiologically depends upon the sigmoid to function as a receptacle for the contents which it passes along. The sigmoid depends upon the rectum and the rectum in turn on the sphincter ani. Trace your rectal impaction to the sigmoid and then to the colon with the poisonous products formed, irritating, inflaming, ulcerating. Secretions are irritated, blood current contaminated, the nerve terminals in the sensitive bowel surfaces fretted, the functions of life disturbed—a familiar picture of evil spirits.

As we know, the motor nerves of the sympathetic go to the involuntary muscle fibres of the intestines to preside over their peristaltic actions, and to the walls of the blood vessels to control the blood supply. The large intestine, except for the anal sphincter, is supplied separately from the rest of the intestinal canal. The vagus control ends at the illeocecal valve, while the anal sphincter receives its sympathetic supply from the thoracicolumbar outflow. The colon and rectum receive their supply from the second and third sacral which form the pelvic nerve and from the hypogastric plexus which is located on the walls of the rectum and bladder.

The sympathetic receives its stimulation and inhibition to action through the terminal endings in the walls of the blood vessels, intestinal coats and mental emotions. Any excessive stimulation or inhibition tends to an abnormal condition and if over a protracted time results in a disease of the organ affected. By disturbing the function of Auerbach's or Meissner's plexus we begin a trend of events wholly inimical to health. All of this leads to the question of intake and output of the gastrointestinal canal and the regulation of the habits of the individual.

The principal control of the sympathetic supply to the large intestine is by way of the mouth. In diet we have an opportunity to either use or abuse this organ. The old hackneyed expressions, such as, "Tell me what you eat and I'll tell you what you are," and, "We dig our graves with our teeth," are illustrative of the estimate of value placed upon diet. It is necessary, therefore, to give attention to proper balanced diets, never forgetting the need of proper ratio of CHO, protein and fats as well as vitamins A, B, C, etc.

One thought worth remembering is that overfeeding in infancy and childhood causes lengthening and overdevelopment of the bowel, for which there is not room in the abdomen and, therefore, peristalsis is impeded and passage of bowel contents delayed.

COLITIS

We all regard colitis as a chronic catarrh of the large bowel, involving the entire length of the bowel, the appendix and even the ileum. The usual classification is:

Mucous membranous: due to local irritation, adhesions and inflammation; for instance, an adherent gallbladder, adhesions to the tubes or ovaries or a badly inflamed appendix. Remove the cause and a cure is usually affected.

Hypertrophic: a submucous edema.

Ulcerative: best named by the stage reached.

Polypoid ulcerative, granular, and others according to fanciful differentiation of various writers.

Hemorrhage colitis is a rare and fatal disease. It is supposed to be due to a bacterial infection which induces a hemorrhagic inflammation. Putting the colon at rest by an ileostomy or some other operation of choice and irrigation is the only treatment worth while. I fully believe that colitis may result from a chronic appendicitis, or chronic appendix from a chronic colitis. The appendix discharges septic material into the cecum and like a prairie fire it spreads through the colon. I cannot quote any authority but it seems to me that stasis of the colon would be a logical cause of colitis.

In enteroptosis the walls are much dilated and, therefore, become thin and constipation, a stage of colitis, is present. It is logical to regard enteroptosis as one of the many causes of colitis.

The x-ray will show a cecum and ascending colon dilated, while the transverse colon shows narrowing and the haustra not normal in their constrictions. The narrowing is usually more noticeable and marked after the middle of the transverse colon is passed, involving also splenic flexure, descending and ileac colon. The ends of the pelvic colon and rectum are wider.

The effort of the irritated bowel to empty its foul contents increases peristalsis and you have diarrhea, the result of spasm. This condition may pass fecal matter through the descending pelvic colon and yet have a greatly dilated cecum and ascending colon, with walls thickly coated with putrescent matter, a deplorable stasis. The great spasticity of descending and pelvic colons will surely develop a thickening of their walls.

To what does this stasis and spastic condition lead? There is only one answer: First, absorption of poisons, autoinfection; second, a train of sequelæ, neuritis, arthritis, iritis, headache, mental depression and a life of misery; third, abdominal tenderness and soreness, griping pains following the line of colon across the abdomen and cecum to sigmoid; fourth, finally ulcers may appear and be persistent and not heal and you have a precancerous condition.

The bowel wall can be so weakened that it yields to pressure and the mucous lining is crowded through the muscular structure of the bowel and you get a diverticulitis. This often becomes a precancerous condition. This may occur at any part of the intestinal tract, but occurs most in cecum or sigmoid, oftener in sigmoid. The muscular fibers which throw the bowels into pouches favor the formation of diverticula. Diverticulitis is a result of stasis. Sometimes extraintestinal pressure forces a diverticulum into the bowel lumen.

Adhesions most usually develop and occur. There may be perforation from retained concretions. Much pathology may result. From the years of irritation, cancer is only too frequent a sequela.

Many of our colitis cases are so neurasthenic that some doctors have advanced the theory that the origin of colitis may be neurotic. To me it seems a result rather than a cause. In either the constipation or diarrhea of colitis the nervous system which supplies the mucous membrane of the bowel is at fault. In either condition we find an abnormal condition of the sympathetic nervous system. The abdominal brain is a monitor over the functions of the viscera. Nagging of irritated nerves crying for help will sooner or later exhaust or impair this delicate system, and the whole nervous system is undermined. There is an absence of the normal rhythmic action of nerve filaments, followed by a distressing group of danger signals from headaches to neuritis. A state of disorder exists and fatigue toxins play their jazz music so sweet to the self-pitying, despondent unfortunate. Any interference with the automatic action of the sympathetic nervous system plays an important part in the phenomena of disease, and all body functions of the entire organism and all its metabolic changes in the tissues.

I love often to refer to Hilton's great work on "Rest and Pain." Its wonderful suggestions guide in interpreting the aches and pains of the body and, if we were to heed its valuable suggestions, more of us would be successful in our professional work.

ULCERATIVE COLITIS

I wish to deal now with ulcerative colitis, a disease so persistent and intractable. This infection begins in the rectum and lower colon. Therefore, you should never fail to use your proctoscope when first consulted by a patient suffering with symptoms pointing to ulcerative colitis.

I desire to give credit to Dr. Bargen of the Mayo Clinic for his great work during the past three years in his investigations into the cause and treatment of this disease. A gram-positive diplococcus has been isolated from lesions in the colon and also in foci in teeth and tonsils. Removal of these foci has been followed by improvement of the ulcerated condition in the colon.

His conclusions are that it is infectious in origin and that the infection is brought about by repeated showers of infection into the colon from the blood stream. He reports many cases following acute respiratory infection.

The proctoscopic examination findings are characteristic. In the early stage the mucosa is edematous, granular and bleeds easily and later may break down and form miliary abscesses and shaggy ulcers. There is practically no normal membrane to be seen. In the ulcers superimposed on the granular base there is often superficial sloughing. You find with this contractions, due to healing and scar formation of periods of previous activity. In differentiating you will find the amebic ulcer discreet and, unless in a very serious case, there is normal mucous membrane between ulcers. They are umbilicated, less than a centimeter in diameter, punched out, with a membrane over the base which bleeds when swabbed. The x-ray verifies the diagnosis of ulcerative colitis.

In the early stages the rectum is not contracted and there is an absence of haustrations. The disease may be localized in the rectum and sigmoid, or continue to the colon, where it causes contractions which show sausage-like on the x-ray, or dilated and stove-pipe in appearance. In some cases the colon becomes almost obstructed and at some points has only a very narrow passage.

Dr. Bargen found in his experimental work that rabbits injected intravenously with the material taken from ulcers died in two days. Extensive lesions were found in their colons—hemorrhage, pus, ulcers, etc. The microscope showed many diplococci in the ulcers. On the strength of his findings, Dr. Bargen began treating his cases with vaccines. A group of one hundred cases, covering a period of eighteen months, showed twenty-seven well; forty-seven at least fifty per cent better than before vaccines were used; two dead; five no better. Sixteen were operated on. Fourteen of the hundred had been operated on before treatment.

The first vaccine dose given is always small, 1/10 c.c., and even then you may get a diarrhea. The dose, increased as tolerance increases, frequently reaches 1½ c.c.

As a routine he gives ten to fifteen drops tincture iodine. How the action can be explained I do not know. It may be empirical, but the patients are benefited by it. I do know that iodine alone without vaccine gives marked remissions, for I have used it in a few cases while waiting to have vaccine made.

Of Dr. Bargen's one hundred cases, Dr. Buie, the proctologist of Mayo Clinic, found twenty per cent in the rectum and sigmoid, and local applications were made through the proctoscope. Diet seems to have little appreciable effect on the course of the disease, but it is well to avoid seedy fruits or anything that could mechanically damage the ulcerated areas of mucosa.

Some of Dr. Bargen's cases were in desperate condition, having as high as thirty bloody discharges daily. Under treatment this was reduced to one or two normal actions, and the patients rapidly regained strength. It seems to me that his contribution to medical science is one of the greatest things in recent years, for all of us old timers used to look upon ulcerative colitis almost in the same light as malignancy.

Rosenow demonstrated in his experiments that the injection of mixed cultures of staphylococcus and colon bacillus rarely developed lesions of the colon, but found them in the kidney, gallbladder, etc.

Give the patient castor oil at night and in the morning wash out the bowel with enema so as to clean it as far as possible. Use the proctoscope and with sterile swabs take from the surface of the ulcers or bleeding mucosa the material for culture. The swab is placed in test tubes containing warm dextrose brain broth. The process is known as the Rosenow method, of which I know only enough to name it. I know it is a very delicate technic. Never use stock vaccines in this disease. Every case is selective and individual.

The alarming frequency with which patients come to you suffering from frequent bowel movements of blood, pus and mucus, alternating with constipation, sacral or lumbar pain and endless other annoying alarm signals, with a history of treatment for various diseases diagnosed by a variety of doctors, cheerful advisors and fakers, raises the question whether it is possible to make a positive diagnosis from symptoms alone. Certainly not, for the same symptoms are repeated in so many pathologic conditions. I assert no one should dare to make a diagnosis from symptoms alone.

I want to stress one point. If a diarrhea persists beyond a reasonable time, particularly when discharges carry mucus, blood and pus, you have an absolute indication for a digital and proctoscopic examination. Exhaust every scientific means. You owe it to your patients and you owe it to yourselves. It is not good for your feelings to have a patient drift away into another doctor's hands and later learn that you had guessed wrongly. In the light of present knowledge let us make our diagnosis on the living subject instead of at the postmortem table.

Ulcerative colitis begins in the rectum and extends upward. Therefore, the importance of proctoscopic examination which gives the key to the presence or absence of pathology. Tuberculosis usually begins in the right colon. Spasm of the organ makes interpretation and differentiation sometimes difficult. The weakened structure of the bowel in an ulcerated field makes it imperative to use great care in handling it. The proctoscope reveals all grades of pathologic changes.

A polypoid condition sometimes is found in an ulcerative and sloughing stage and must not be mistaken for ulcerative colitis as just described. Very few cases of this condition recover without surgical aid.

There may exist at the same time with colitis, gallbladder, duodenal or appendix trouble, especially if you have gas eructations, sour stomach and vomiting. You should investigate closely for these troubles when these symptoms are marked.

It is hard to differentiate before operation between malignancy, diverticulitis, tuberculosis and advanced ulcerative colitis. A colon x-ray does not always give a picture upon which an unerring diagnosis can be made. A thickened wall of an inflammatory process and stenosis simulate closely and, therefore, you cannot be too sure of your diagnosis prior to surgical exploration. The x-ray will alone aid you in differential diagnosis of diverticulitis, inflammatory processes and recurring ulcerative colitis.

If there be a large hemorrhage from the bowel in ulcerative colitis, it will be due to an erosion of a vessel as often occurs in gastric ulcer. Usually there is not any real hemorrhage in ulcerative colitis. In case you have a real hemorrhage, sloughing will occur with abscess formation and invasion of peritoneal cavity.

Ulcerative colitis is a very chronic disease, often originating in childhood. The older the case the less amenable to treatment and the more pronounced the toxic results, neuritis, arthritis, etc. When we consider the extensive absorptive surface of the colon, we wonder how any case ever escapes alarming and serious sequelæ. Patients who constantly complain of gas pains are chronic cases almost invariably.

The nervous system is susceptible to the nfluence of toxemia either of exogenous or endogenous origin. Toxemia of intestinal origin is more easily produced and is more strikingly marked when general health is impaired by previous illnesses and the power of resistance has been lowered, and when aided by heredity, personal neglect or unhealthy environment.

TREATMENT OF COLITIS

A great requisite is a sensible patient. Outline a liberal diet, well balanced and nontoxic, of green vegetables (often pureed), fruits and butter fat, whole wheat bread, omitting meat entirely. To prevent the absorption of toxins of protein decomposition use a liquid petrolatum that is of napthene base rather than parafine in character. The reason for this is the end-products of decomposition, such as indol, skatol, phenol, etc., are napthenes and, therefore, soluble in a napthene oil.

For putrefaction in the colon give collodial kaolin, half tablespoonful doses in glass of hot water early in the morning and before going to bed at night. If there is ileal stasis, it can be cleared out by salines. Kaolin absorbs bacterial toxins and is soothing to the intestines. In conjunction with parafine it renders the feces soft and semisolid and they readily and easily pass through the bowel. When used in this way patients do not complain of the oil leaking through the bowel. I use the kaolin made in London, called "Kayoline Saline."

When a spastic condition exists, use belladonna, 8 to 10 minims three times a day with soda. I use the iodine as a routine treatment. Perhaps as an alterant it does good. Frequent use of the saline enema is a most useful factor in treatment. Kaolin in starch water enema will give pleasing results. Hot enemas are cleansing, antiseptic and stimulating (similarly to external application). They act as a sedative and a food (the body can be sustained for days on water alone). The kidneys are aided in elimination by the enema.

I add to this treatment bacillus acidolphus, one to four drachms in water sweetened with sugar of milk with meals. It furnishes lactic acid to the colon by carbohydrate fermentation. Lactic acid stimulates peristaltic action and empties the colon promptly and putrefaction does not occur. I often implant bacillus acidolphus by syringe in the colon in starch water or whey water with kaolin added to the solution. Before doing this wash out the bowel with saline solution comfortably warm. If constipation is present, use oil enema on retiring, four to eight ounces.

I believe that the development of a favorable flora is an important factor in the treatment of all forms of colitis. The Bulgarian bacillus does not decrease the B. coli and you cannot implant it in the intestinal tract. However, you may change the diet. (I quote from Martin G. Vorhans, a prominent New York bacteriologist.)

Rettger of Yale demonstrated that bacillus acidolphus can be implanted in the intestinal tract and that it will decrease the B. coli. He says that the best results are shown when lactose or dextrin or a combination, lacto-dextrin, are used in large amounts at the time B. acidolphus is employed. Bacillus acidolphus is useful in chronic constipation. You will not get results for three or four days, then the bowels will begin to move. When using B. acidolphus I always make a restriction of animal protein imperative. Vegetable protein is not inhibitive to fermentative flora and can be used; in fact, it is believed to be supportive to these organisms. I do not get as good results from the milk products carrying bacillus acidolphus as I do from the use of Mulford's preparation. After the flora is well changed, there will be no gas, for the bacillus acidolphus suppresses the growth of gas forming bacteria. The B. coli rapidly decrease with the use of bacillus acidolphus. It is well to add lactose or Parke Davis lactone to milk to support the bacillus acidolphus. The dropping of the colon is corrected by use of a belt. It holds the viscera up and keeps the blood from puddling in the mesenteric veins. Abdominal massage, sunshine, fresh air, physical exercise cannot be overlooked.

Look well to mineral nutrition and mineral balance, as it is necessary to cell life. It has been customary to give lactate or some form of calcium. There is on the market a mineral food known as "Minerasal." This contains all the mineral elements of the body. It is palatable and is absorbed and assimilated rapidly. I am using it in a number of cases and fancy I note improvement.

Always tell your patients that even with marked improvement they may expect recurrences. Under this treatment toxemic troubles clear up. The skin becomes clear, strength returns, appetite improves, weight is gained, vigor and good health are restored.

Intestinal toxemia is due to overloading of the intestinal tract by an overplus of protein diet, with an inaction of the bowel and overtaxing the capacity of the parathyroid gland in its function of detoxicating. There is the same cause of toxicity upon the removal of the parathyroid gland, damage by surgical interference, removal or infection product.

The above facts have been demonstrated and proven by L. Dragstedt, Northwestern University. His statement is: "Parathyroid administered is an aid in the fight against infection of the chronic type, not by its specific action on the infecting organism, but because it places the tissue cells under the most favorable condition for an adequate resistance."

That parathyroid is a regulator of calcium metabolism and is a detoxicating agent is now an accepted truth. Frankel of Vienna Clinic says, "The physiology of parathyroid is the detoxicator of the body."

Administer parathyroid in 1/10 gr. dose in many cases of ulcerative colitis on the theory given. If parathyroid will cure leg ulcers by the addition of chloride of calcium, why may we not hope for a benefit in colon ulcers? The intravenous use of calcium is necessary to get a high percentage of cures. Dr. C. B. Frisbie, of Portland, Ore., has had great success with parathyroid in ulcerative colitis cases, combined with nontoxic diet, flora changing, etc. He usually gives very small doses of cod liver oil once daily, three times a week, as an ionizing agent.

Thyroid has its place when we have undernutrition and underfunction, as it is the great catalytic agent and controls the rate of energy transformation in cells of body. If the bowel infection overrides the defense of the thyroid, you can have goiter, obesity or living skeleton.

A word only on constipation. Although four out of five Americans suffer from constipation, as a disease it has never become popularized. The possessor does not enter competitive ailment discussion with the same social swagger that the owner of a chronic appendix or baffling gallbladder boasts. Socially it has never been "the thing."

Primarily constipation is due to a subnormal state of the nerve supply of the muscular coat of the digestive tract, involving the sympathetic system and the sacral nerves also may play an important part. The outstanding causes are artificial habits of living, mechanical causes, emotions, worry, fright, anger, fear and jealousy; substitution of drugs or chemical for mechanical stimuli. The real danger point is not the frequency of defecation but the prolonged retention of feces.

The keynote of constipation is inflamed anal and rectal canals, proctitis which inhibits bowel movement. First cure your proctitis, if you would prevent constipation and its attendant evils. When the sewer is obstructed we begin an investigation at the outlet, and section by section trace the obstruction that is causing the accumulation of debris. The plumber does not go to the top of the house to dislodge trouble many feet away, nor does he claim that escaping sewer gas and overflow of waste is the cause of the condition of the drain. The doctor, the human plumber, too often declares this, however, by prescribing bile and various cathartics. The poor crippled and inflamed canal is thus abused and desecrated.

The fact that many cases of prolonged constipation are free from autointoxication seems to refute the hypothesis that autoinfection is largely of fecal origin. We might answer the argument by concluding that the constipation is protective for the reason that the liquids absorbable have all been absorbed and nothing but dry residue remains. But I doubt if you really know any perfectly healthy people who are constipated to be free from headache, vertigo and nervous disorders.

CONCLUSIONS

In proctitis pain is referred to the sacrum and down the limbs. Toilet does not give relief. Stools mucous, blood and pus.

In sigmoiditis pain is referred to the back. Toilet gives relief. Stools watery and scybalus.

Chemical irritation of drugs increases peristalsis for a time but never restores intestinal tone.

Add the juice of a lemon to an enema, if the ordinarily used enema fails to give results.

In painful conditions in the region of the cecum following appendectomy, look for trouble in the rectum and anal canal.

Irritation at the distal end of the bowel often points to trouble in the proximal end.

Constipation usually occurs when the stasis exists in the distal half of the colon.

Diarrhea in stasis in the proximal portion, yet the conditions may alternate in many cases.

Stasis in the cecum opens the appendix to invasion of infection.

The carmine motility test is valuable in making diagnosis of colon conditions. If the color disappears and again appears hours or days later, you can be assured of a dilated cecum, where a portion of the meal used with test is retained. The irritable contraction in a colitis delays appearance of color. Slow disappearance of the color after prompt appearance indicates dilation, usually of the right side of the colon. Carmine test is valuable in postoperative procedure.

The atonic rectum and sigmoid should receive internal massage. Nothing better to use than Hirschman's pneumatic dilator.

When mucus is mixed with the stool, inflammation is indicated. When the stool is covered with mucus, it usually means irritation due to hardened feces.

When stools are frothy there is active fermentation in the bowels.

Scybala are pathognomonic of impaction somewhere between ileocecal valve and sigmoid. Fermentation is decomposition of carbohydrates. Putrefaction is decomposition of proteins which produces autotoxins.

If internal medicine men would use the proctoscope more frequently, they would not make so many gastric neurosis diagnoses.

When you meet a patient who has had many operations without relief and who is anemic, nervous and complains of gas pains and distresses, etc., look for colitis and not always adhesions.

Melancholic patients have loaded colons; cross and cranky patients have rectal trouble.

Don't show the resignation spirit of an undertaker with colon cases. These patients are like prisoners in court, awaiting sentence. Here you can find use for all the powers of psychology and suggestion. Be a high class optimist. Don't take the courage out of your patient by imparting too serious a view of the case; human nature revolts at an unfavorable diagnosis. Don't take away the incentive for cooperation and faithful obedience to orders. Utilize his courage in establishing mental and physical balance. Fear, worry, lack of courage prevent some from making a good recovery. Don't rob a man of hope of recovery so that your diagnosis may be vindicated. Optimism is an asset; pessimism, fear and discouragement are liabilities. The nervous strain from this class of patients, unsupported by an assuring confidence to be gotten from the face of his doctor, often leads to a fatal result when recovery was possible. Direct his mentality into healthy and hopeful channels. A mental change often works miracles. Make not only a physical but a mental diagnosis and you will be rewarded with good results. Enkindle faith in your patient's subconscious mind which controls thought and our bodies.

ABDOMINAL ADHESIONS*

H. J. Whitacre, M.D.
TACOMA, WASH.

The subject of adbdominal adhesions has a sufficiently voluminous literature and there is enough divergence of opinion regarding etiology, pathology and treatment to justify the conclusion that it is an unsolved problem. During the past two years I have been called upon to solve some very difficult problems in this field of surgery at the U. S. Veterans' Hospital for the State of Washington, and without attempting to review the literature or weigh conflicting theories shall present a personal experience and personal conclusions.

This hospital serves 75,000 U. S. Veterans of all wars since 1898 and includes men of all ages. Sixty per cent of the patients presenting themselves to the surgical department give "stomach trouble" as their chief complaint. Within this group we find a great many patients suffering from gallbladder disease, ulcer of the stomach, ulcer of the duodenum, appendicitis and a particularly large number of men who have had from one to seven previous abdominal operations. I shall discuss only the adhesion phase in each of the conditions mentioned.

Cholecystitis is particularly prone to produce adhesions in its neighborhood. In some cases the entire right upper quadrant is involved with the pylorus and pyloric end of the stomach glued to the under surface of the liver, the duodenum buried deep and the colon involved in the tangle. In a second group of cases the destructive pericholecystitis is limited to the region of the pelvis of the gallbladder and tight deforming adhesions are formed between it and the duodenum. In a third group of cases a milder infection has prevailed and a thin, long sheet-sail type of adhesion forms which extends from the entire length of the gallbladder on the one side to the duodenum on the other.

I am quite fully convinced that a patient suffering from chronic cholecystitis has symptoms in direct proportion to the degree in which adhesions cripple his duodenum, his stomach or his duct system; that a patient may have adhesions without resulting symptoms, and lastly that the patient who has crippling adhesions will not get complete relief from a gallbladder operation unless his adhesions are properly cured.

When the entire right upper quadrant is involved, and the pylorus is hung up, or the doudenum is distorted or the colon is kinked, there is no difficulty in understanding the relationship of the adhesions to the symptoms from which the patient suffers. Every organ in the region is very evidently crippled and we know that something ought to be done to restore normal mobility to the hollow viscera of the area. It is always possible to dig the infected gallbladder out of the tangled mass, but what shall we do with the adhesions and the raw surfaces that are left by the dissection?

It is not so easy to understand our full surgical obligation when the adhesions are limited to the pelvis of the gallbladder. Patients in this group have just as severe symptoms of digestive disturbance as those with widespread adhesions, and it is much easier to overlook the detail of adhesion repair after the gallbladder has been removed. I feel quite certain that short firm adhesions at the pelvis of the gallbladder are the symptom-producing factor in any group, and it therefore becomes a matter of great importance to deal effectively with them.

Sheet-sail adhesions that do not restrict the mobility of the duodenum do not produce symptoms. When I am operating in the lower abdomen and find this type of adhesion, I do not consider it to be of sufficient importance to call for operative relief.

Ulcer of the stomach is frequently complicated by adhesion to the pancreas and an operative cure will not be accomplished without provision for preventing recurrence of this adhesion.

A very large percentage of the patients who present themselves with abdominal symptoms have had from one to seven pervious abdominal operations without relief. Appendicitis ranks first, gallbladder second and ulcer third. In a great many of the cases in this group the symptoms have persisted after operation because the primary diagnosis was in error, but this is another story. Almost all of these cases have crippling postoperative adhesions, and I am forced to conclude that war veterans are either prone to adhesions or that the surgeons who operated did not handle the peritoneum properly. The omentum is almost uniformly adherent to the cecum and the abdominal scar after appendix operations. Every grade of crippling adhesion is formed in the right upper quadrant after gallbladder operations and the ulcer patients have not gotten well because of unrelieved adhesions around the pylorus and duodenum, or because

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of new kinking adhesions in the region of the anastomosis.

Omental adhesions to the scar and to the cecum after an internal operation for appendicitis must be the result of rough handling and bad closure technic. I am very certain that the same may be said about adhesions following a clean uncomplicated gallbladder operation, and I am equally certain that a patient will not be cured of his symptoms when a bad gallbladder is dug out of a mass of adhesions and the adhesions and raw surfaces left to take care of themselves. Assuredly symptom-producing adhesions should not form around a clean gastroenterostomy.

With attention thus centered upon the adhesion element in the various conditions mentioned our problem has been to relieve these patients of their symptoms, take them off the disability and compensation list and send them back to work.

Before proceeding with a description of the technic I should like to say a word about the departmental cooperation that prevails at Cushman Hospital in the diagnosis of these abdominal cases. A full history is primarily taken. A special examination and report is made by a heart expert; our lung specialist reports his findings by physical and fluoroscopic x-ray examination, and in many cases a neurologic examination is recorded. Invariably there is a full examination by a dentist and by an eye, ear, nose and throat specialist. A full laboratory study of urine, blood and gastric contents is made and a gastrointestinal x-ray study reported.

After this material has been assembled the patient is presented to the resident surgeon and myself for a decision as to surgical treatment. In a fairly large percentage of cases immediate surgical operation is not deemed wise. A consultation is held with the medical officer in charge and one month of treatment in the medical wards is instituted. After this period every case thus referred is again reviewed in consultation. Dr. Manion of the medical department has shown surpassing ability in the management of these borderline cases. In the last seventy-two cases thus referred he has been able to cure 70 per cent by clearing up focal infections, diet regulation and some medicinal treatment. In only twelve cases was it found necessary to return the patient to the surgical department for operation.

The technic of procedure employed in the management of adhesions is nothing more than a painstaking peritoneal plastic operation. The crippling effect of each adhesion is first studied. Every adhesion band is painstakingly clamped, not torn, and tied without trauma to the peritoneal covering of that part of the band that is to be left behind. In the right upper quadrant the separation of adhesions invariably leaves raw areas on the surface of the duodenum, on the pylorus, over the duct system and on the under surface of the liver. Sometimes there are peritoneal covered tags or flaps of omentum in the immediate neighborhood that may be used to cover these areas and a No. 00 plain catgut is used to hold a flap accurately in the desired position.

When there is no tissue immediately available, a free omental transplant is very gently removed and sutured with greatest care over the raw areas. This transplant is often three by six inches in size and covers the entire duodenum and pylorus. I consider it to be a matter of great importance accurately to suture the upper edge of the transplant over and around the duct system in the region of the foramen of Winslow and to the posterior parietal peritoneum in the kidney pocket. The bed of the gallbladder should always be sutured over after cholecystectomy and a flap of omentum should be sutured over the cystic duct stump. This technic will do much to prevent postoperative stricture of the common duct.

Nature has a way of tucking the omentum into irritation areas in her effort to heal, but nature's method will not succeed in a majority of instances because new bands of crippling traction will be produced. The hollow viscera and the gland ducts of the right upper quadrant must have an unrestricted mobility and this can be restored in adhesion cases only by carefully covering their surfaces with peritoneum.

The results that have come out of this method of treating adhesions have been most gratifying and I feel that surgical results have their severest test in this veterans' service, where men get free board and eighty dollars a month when they are ill and this compensation is cut off when they admit that they are well. Our results have been so uniformly good that we very confidently look for a cure in these unfortunate sufferers. By an understanding of reconstruction of intraabdominal anatomy, men who have carried a diagnosis of chronic gastritis, nervous indigestion, malingery, neurasthenia or a psychosis have been made comfortable and restored to their occupation.

CARDIAC PAIN*

G. F. Strong, M.D.
VANCOUVER, B. C.

In discussing this symptom I want to mention, first, the clinical conditions in which pain arises from the heart, then the manner in which this pain is produced, and, last, the nerve pathways along which this sensation travels.

The various clinical conditions in which cardiac pain occurs may be discussed under four headings: (1) Pain due to fatigue, (2) pain of irritable heart, (3) paroxysmal pain—angina pectoris, (4) pain of coronary thrombosis.

PAIN DUE TO FATIGUE

The idea that pain may arise from fatigued heart muscle is strengthened by the fact that pain occurs in voluntary muscle that is overstrained. Fatigue may be produced in a healthy muscle, voluntary or cardiac. Fatigue is more easily produced, less effort is required to overstrain the muscle, in the presence of disease or any diminution of the blood supply. When a muscle contracts actively it requires more blood than when quiet. Therefore, when the heart is called upon to meet increased demands its blood supply must be increased, and increased in proportion to the increased demands, if the heart is to function adequately. The reserve power of a healthy heart is considerable and it is only severe overstrain that will produce pain.

This sort of pain commonly occurs in the hypertrophied hearts of hypertension patients. In fact, it is common in hypertrophied hearts from whatever cause that hypertrophy may occur. The pain occurs in hearts with chronic valvular disease, possibly more particularly aortic disease, but also in some cases of well defined mitral stenosis. This fatigue pain also occurs in those types of cardiac arrhythmia characterized by excessively rapid rates. Thus, in paroxysmal tachycardia or paroxysmal auricular flutter or fibrillation, this pain may be produced. It is also seen in untreated cases of permanent fibrillation. This type of pain, simple fatigue pain, occurs usually around the apex, in the submammary region, and radiates, if at all, around the chest or through the chest to the back.

The pain is generally of a dull aching character, though at times it may be sharp and stabbing, even to being confused with a mild angina. It is a continuous ache rather than a paroxysm of severe pain. In some cases of coronary artery disease, a condition of fatigue pain may arise quite distinct from the typical anginal attacks that may also occur in this condition. This pain may present features that make its distinction from the more ominous types of cardiac pain difficult. In that case a therapeutic test will frequently be of assistance. Fatigue pain is invariably benefited by rest and digitalis, and is not relieved by the nitrites, whereas the pain of angina, with which it is most likely to be confused, is usually immediately relieved by one of the nitrites.

THE PAIN DUE TO IRRITABLE HEART

The pain occurring in irritable heart or effort syndrome is probably an expression of hyperexcitability of the nervous system. In this discussion we must bear in mind that in the production of pain there are always two important factors, first, the stimulus and, second, the nervous mechanism. We know that people vary considerably in their interpretation of pain. A stimulus sufficient to produce severe pain in one may produce a mild pain in another, and no sensation at all in a third.

The pain of irritable heart is felt because of the individual's lowered threshold for pain. An amount of strain borne with ease by a person with normal nervous mechanism will produce pain in these patients with the so-called effort syndrome. It is obviously difficult for a doctor to decide on a patient's response to pain, especially in such condition as this, where there may be no objective signs of cardiac disease by which to estimate the amount of pain the patient would be likely to experience.

Libman of New York has used for some years the simple procedure of causing pressure on the styloid process of the radius and observing the patient's reaction. Osler suggested steady pressure with the handle of a knife or the finger on the sternum just above the attachment of the xiphoid. This latter procedure causes a disagreeable gnawing ache that is disturbing even to a normal person.

The pain in irritable heart, unlike other forms of cardiac pain, arises as a result of excitement as often as a result of effort. Like simple fatigue pain, this is a continuous precordial ache radiating, if at all, around the chest to the back. There is no doubt that many cases present combinations of these two types of pain, simple fatigue and irritable heart pain.

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PAROXYSMAL PAIN—ANGINA PECTORIS

Angina pectoris is best described by quoting from the classical description of it written by Heberden[1] in 1768.

> "But there is a disorder of the breast marked with strong and peculiar symptoms, considerable for the kind of danger belonging to it, and not extremely rare, which deserves to be mentioned here at length. The seat of it, and sense of strangling and anxiety with which it is attended, may make it not improperly be called angina pectoris.
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> "Those who are afflicted with it are seized while they are walking (more especially if it be up-hill and soon after eating) with a painful and most disagreeable sensation in the breast, which seems as if it would extinguish life if it were to increase or to continue; but the moment they stand still all this uneasiness vanishes.
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> "In all other respects the patients are, at the beginning of the disorder, perfectly well, and in particular have no shortness of breath from which it is totally different. The pain is sometimes situated in the upper part, sometimes in the middle, sometimes at the bottom of the os sterni, and often more inclined to the left than to the right side. It likewise very frequently extends from the breast to the middle of the arm. The pulse is, at least sometimes, not disturbed by this pain, as I have had opportunities of observing by feeling the pulse during the paroxysm. Males are most liable to this disease, especially such as have passed their fiftieth year. After it has continued a year or more, it will not cease as instantaneously upon standing still, and it will come on not only when the persons are walking but when they are lying down, especially if they lie on the left side, and oblige them to rise out of their beds. In some inveterate cases it has been brought on by the motion of a horse or a carriage and even by swallowing, coughing, going to stool, speaking, or any disturbance of mind.
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> "Such is the usual appearance of this disease, but some varieties may be met with. Some have been seized while they were standing still or sitting, also upon first waking out of a sleep, and the pain sometimes reaches down the right arm as well as the left and even down to the hands, but this is uncommon; in a very few persons the arm has at the same time been numbed and swelled. In one or two persons the pain has lasted some hours or even days, but this has happened when the complaint has been of long standing and thoroughly rooted in the constitution; once only the very first attack continued the whole night."

From the time the name and first description were given by Heberden in 1768, it must be admitted that, except for theories as to its cause, little of importance has been added to the clinical conception of the disease until the monumental work by the late Sir James MacKenzie.[2] When we come to study angina pectoris, or cardiac pain in general we realize what a tremendous influence MacKenzie has left on our ideas in this regard. Of the various theories as to the cause of angina and there have been many; Huchard at one time collected eighty. There seem to me to be only two that warrant careful consideration at the present time. (1) The theory that the pain arises from the muscle of the heart. (2) The theory that angina is due to the disease of the first part of the aorta.

The idea that the muscle may under certain conditions give rise to severe paroxysmal pain is by no means new, although it is an idea that MacKenzie has done much to clarify. Any of the older theories that angina depended on coronary vessel disease presumed that the way in which this vascular damage brought about angina was by the alteration, always diminution, in the blood supply to the heart muscle. Ischemia, either transient as in coronary spasm, permanent as in coronary sclerosis, or relative as with those coronary vessels incapable of dilating to increase the blood supply to the muscle in times of increased cardiac effort, was advanced as the underlying cause of the pain. MacKenzie has broadened this conception by the idea that pain is due to exhaustion of the heart muscle. This exhaustion brought on by overstrain in the healthy heart and by lesser strain in the diseased hearts in which ischemia to some degree is usually present. This ischemia in these diseased hearts may be produced (1) as a result of arteriosclerosis of the coronary arteries, (2) as a result of diminution in the size of the orifices of these arteries due to disease of the aorta or aortic valves, and (3) as a result of a regional vascular crisis affecting the coronary vessels, a temporary constriction or spasm causing ischemia of the heart muscle.

Arteriosclerosis of the coronary arteries may occur as a part of generalized arteriosclerosis, in which case the cause of the angina will usually be clear, but arteriosclerosis of the coronary arteries may also occur as a circumscribed patch of arterial disease, with perfectly normal systemic vessels. In either case the disease of the coronaries may be of sufficient extent to produce a relative ischemia of the heart muscle with resulting paroxysms of pain. On the other hand, it is not unusual at all to see cases at postmortem with extensive coronary disease, that have had no history of anginal attacks. This only evidences again the wide variation in individual response not only as to the reserve power of the heart but also in the individual's interpretation of pain.

Diminution of the orifices of the coronary arteries is quite likely to produce angina, but it does not often occur as an isolated lesion, that is to say, there is usually some additional involvement of the coronary vessels.

That angina may be due to arterial spasm in the coronary circulation is based on the following evidence: (1) Many clinically well defined cases of angina pectoris show at autopsy normal hearts, aortæ and coronary vessels. (2) Regional vascular crises do occur in the vessels of the brain, retina and various systemic arteries. (3) The coronary vessels probably are under the influence of vasomotor nerves and if so are as susceptible to spasm as any other arteries.

Certain European critics of MacKenzie's views of angina claim that the pain is due to fatigue of the muscle, not exhaustion. This seems a distinction without a difference, a quibbling over mere words, because in either case the actual stimulus for the production of the pain is probably a chemical one, resulting from the improper elimination of the end-products of muscular activity.

Allbutt's theory that in angina the pain arises as a result of disease of the first part of the aorta, with resulting stimulation of the sensory nerve endings found there, seems to me a far less comprehensive view than that of MacKenzie's. There are, no doubt, cases of aortitis, in which pain and even paroxysmal attacks of pain may be produced by this mechanism, but I cannot believe that we can explain all cases of angina by this theory. Cases are recorded in which pathologic examination failed to reveal any evidence of aortic disease. Allbutt answers by saying that the pathologic examination in such cases is not extensive enough to demonstrate the causal lesions in the wall of the aorta.

The opinion on this continent and in England favors, I believe, MacKenzie's idea. Allbutt's theory is not, however, without support for recently a prominent European cardiologist, Wenckebach[3] in Vienna, has lent the weight of his prestige to this theory. There are no doubt cases with disease of the proximal part of the aorta, in which that disease involves the orifices of the coronary vessels and so causes a diminution in the blood supply to the heart muscle. In such cases the aortic disease becomes a contributing cause of the anginal attack which remains, however, a direct result of the muscle exhaustion consequent upon a reduced blood supply.

Pseudoangina is a term that should be dropped. It creates a false impression in our minds and is apt to be misinterpreted by the patient.

Angina pectoris is not uniformly fatal. The degree of severity of the attack gives us no indication of the prognosis of the case. Mild cases may die in their first attack and severe cases may recover and live for years to die of some other cause. I referred before to the therapeutic test, where there is difficulty in the diagnosis between mild angina and less serious forms of heart pain. Paroxysmal cardiac pain associated with or aggravated by exertion and relieved by one of the nitrites is angina pectoris. It is, of course, true that other measures will benefit anginal cases. In fact, in some types of the disease rest accomplishes a surprisingly beneficial result. In angina, as in other conditions in which pain occurs, it is often important to ascertain the patient's interpretation of or response to painful procedures.

PAIN OF CORONARY THROMBOSIS

The pain resulting from coronary thrombosis differs from any other form of cardiac pain in the degree of its severity. It is a long continued, very severe substernal pain, not relieved by rest, digitalis or nitrites but demanding large doses of morphine for its alleviation. There is no doubt that many of the cases of status anginosus of the older writers were instances of coronary thrombosis. Coronary thrombosis frequently occurs in an artery already diseased and may, therefore, occur in a patient suffering from angina, although it may also occur as a bolt from the blue in a patient apparently in perfect health. The onset of the attack is constant. A sudden prostrating pain occurs, usually following some exertion. The pain is substernal as in angina, not apical as in simple fatigue or irritable heart. The pain may occasionally be epigastric or right or left hypochrondial, in which case a difficulty may arise in the differential diagnosis between coronary thrombosis and gallstone colic or perforated gastric ulcer. A fair number of cases have been reported recently from well equipped surgical clinics, where the abdomen has been opened for an upper abdominal lesion only to find that the patient suffered from coronary thrombosis.

It is important to remember that recovery may and frequently does occur in these cases and the fact that a patient recovers and leads a moderately active life after one of these attacks is not evidence of a mistake in diagnosis. The diagnosis of coronary thrombosis can usually be made from the character of the pain. The electrocardiograph may be of use in diagnosis, as most of these thrombosis cases will show a very definite deviation from the normal tracing.

I have deliberately omitted from this discussion two conditions in which precordial pain occurs, aortitis and percarditis, because I wanted to confine myself to true cardiac pain, pain arising from the heart itself. In aortitis a pain may arise as a result of stimulation of the sensory nerve endings in the aorta. It is a dull, high, substernal pain; it may be quite severe in character and it is usually not paroxysmal. A therapeutic test may be required to distinguish it from true cardiac pain, in which case aortic pains are only slightly if at all benefited by digitalis and the nitrites but are usually relieved by antiluetic treatment. The pain of pericarditis is usually distinctive and should offer no diagnostic difficulties. It probably arises from the inflamed serous membrane and as such is not a true cardiac pain.

Before leaving this part of the discussion I want to mention the pathology of these four conditions, fatigue, irritable heart, angina and coronary thrombosis. We must remember that these conditions (except coronary thrombosis) are functional. The pain arises as a result of exhaustion of the heart muscle and there will be, therefore, no constant pathologic picture. I am not at all sure to what extent the infarct itself gives rise to the pain in thrombosis. The resulting strain on the unaffected portions of the heart would undoubtedly be sufficient to cause some of the agonizing pain these patients suffer.

Most theories as to the cause of the pain in angina carry us only so far. Beyond that to the actual origin of the sensation little had been done until MacKenzie's work.[2] The foundation of that work was an attempt to arrive at an understanding of heart failure, and he has reached the conclusion that this is shown by a limitation of the field of response to effort, and that limitation is brought about by the patient's own distressing sensations. The sensations so produced are chiefly of two kinds, pain and breathlessness. We are here concerned only with his observations regarding the production of the sensation of pain.

It is well known that muscle, both voluntary and involuntary, may give rise to pain. In voluntary muscle we find pain occurring as a result of overexertion, particularly if it affects a muscle with an impaired blood supply. For instance, if a tourniquet be applied to the upper arm tightly enough to cut off the blood supply, continued contractions of the hand will cause severe pain in the hand and lower arm. Pain arises from involuntary muscles under a variety of circumstances. Every instance of severe abdominal pain, for example, whose origin can be recognized, has been found associated with a hollow muscular organ, as in renal and gallstone colic, in colic of the bowel, and in contractions of the gravid uterus, and it is a justifiable inference that pain in colic is a result of violent contraction of the hollow muscle. Another type of pain produced by excessive contraction of an involuntary muscle is that occurring in the ciliary muscle of the eye as a result of errors of refraction. Pain, therefore, may arise from any muscular tissue, but such a sensation is only produced under certain circumstances, severe prolonged contraction.

We know that in the healthy heart there is a very considerable reserve power, the nature of which was never clear until MacKenzie brought forward his theory of fluctuation. It was formerly taught that the heart followed the so-called law of "all or nothing" of muscular activity. MacKenzie has shown, however, that such is not the case and that the heart muscle cells show a constant fluctuation in their activity; some are resting, others contracting, and vice versa. This idea conforms with the fluctuation that we know occurs in certain other organs of the body, as in glands, in the end capillaries and in the kidney. The proportion of actively contracting muscle cells would, therefore, determine the strength of the heart's response, and in times of greater demands more and more muscle cells would contract. In other words, the reserve power of the heart would be called upon.

In certain diseased states, especially those associated with a diminished blood supply, the number of cells available to supply extra strength in case of increased demands is limited, either because they are injured by the disease, or because they are weakened by a deficient blood supply. As a result, those cells capable of responding are called upon for contractions that are excessive and as a result give rise to the sensation of pain. It seems a reasonable conclusion that it is not the contraction per se that produces pain but rather the exhaustion produced by the excessive activity. Exhaustion is relative and is brought about in muscle tissue only by contraction. A diseased muscle or one with a diminished blood supply will become exhausted more readily than a healthy one.

The heart is a hollow muscular organ, but its activities are modified because of the nature of its work. The pain of various kinds of colic is due to spasm of certain muscular organs. Spasm of the heart is incompatible with life. Pain arising from the heart is not due to spasm. The heart may produce pain when it is called upon for greater effort than is normally expected of it, or with slowly progressive disease of the heart muscle or the arteries supplying it, pain may arise as the first evidence of the heart's inability to carry on its customary activities. If the immediate cause of the pain is exhaustion, then the pain should occur at the time the heart is strained. In certain patients this is not the case. The pain may come on at a period of bodily quiet, as at night when the patient is asleep or during the day when he is resting.

This pain may be explained as a summation effect of many small stimuli. In a nerve muscle preparation, when a subminimal stimulus is applied to the nerve, there is no response from the muscle. If this stimulus be repeated often enough and frequently enough, a contraction eventually occurs. This same summation effect may be responsible for the pain in cardiac conditions. The exhaustion of the muscle may produce stimuli subminimal in character which can only cause pain by a summation effect.

In this connection it is of interest to note that most anginal cases have their first attacks as a direct result of exertion. Subsequently they attempt to avoid the exertion sufficient to bring on an attack· and it is then that these rather atypical attacks occur at a time when the body is at rest. Whether the pain be due to simple fatigue, irritable heart, coronary disease or spasm, the immediate cause of that pain is always exhaustion of the heart muscle. The tremendous influence left on the medicine of our day by Sir James MacKenzie will be ascribed in the future, I am sure, to his insistence on the importance of the factor of muscle exhaustion in the whole field of the study of cardiac disease.

The stimulus for the production of cardiac pain is a chemical one, resulting from exhaustion. When a muscle contracts a definite chemical change occurs. There is an oxidation of glucose with a resulting production of lactic acid, carbon dioxide and water. In a relative deficiency of the oxygen supply to a contracting muscle, as would occur either in excessive strain or in conditions where there was a diminution in the blood supply, the production of lactic acid is increased. The actual cause of pain arising from a contracting muscle may be lactic acid or some similar metabolite present because of deficient oxidation. Other factors than muscle exhaustion may be present in cases of coronary thrombosis where a cardiac infarct occurs with the usual pathologic results.

NERVE SUPPLY

The heart receives its nerves from two sources, the vagus and the sympathetic, and to the heart as to any other viscus there is an afferent as well as an efferent supply. In the case of the heart this afferent supply has not received the same consideration given the efferent nerves, with the result that our knowledge of these centripetal fibers is comparatively vague.

The sympathetic nerves to the heart arise from the last cervical and first four dorsal anterior roots, the white rami communicates passing to the stellate and corresponding sympathetic ganglia, from there some of them proceeding up the cervical sympathetic trunk to the inferior, middle and higher to the superior cervical ganglion. From these ganglia, which contain the sympathetic cell bodies, the medullated fibers arise which run to the heart, where they pass directly to the muscle cells without the intervention of other nerve cells. This is quite different from the case of the vagus, where the cardiac branches communicate with the heart muscle only through the intervention of the cells of the intrinsic cardiac ganglia, as represented by the sinoauricular node in mammals. The major accelerator nerve is made up of twigs from the stellate and the three dorsal ganglia. The minor accelerator nerve or nerves are those branches represented as arising from each of the three cervical ganglion, from which they go to the heart, where they pass through the deep cardiac plexus.

The vagus nerve arises by a number of roots from its centers in the medulla. The cardiac branches are usually two cervical, a superior and an inferior, and two thoracic, one from the recurrent laryngeal and the other from the main trunk of the vagus in the thorax. These pass through the cardiac plexuses to their communication with the nerve cells of the sinoauricular, and auriculoventricular nodes, and to the other intrinsic nerve cells of the heart, through which they connect with the muscle cells.

Afferent fibers are undoubtedly to be found accompanying many of the efferent cardiac nerves, although their exact course is not yet settled. It is agreed that the cell bodies of those afferent nerves are to be found in the ganglia of the ninth and tenth cranial and usually the last cervical and first four thoracic spinal nerves. These afferent fibers conduct various kinds of sensations, some of which never rise into consciousness, and others like pain which are readily perceived.

The first afferent pathway to be demonstrated experimentally was the depressor nerve. This is a bundle of fibers associated with the vagus which takes a different course in different species, and which even varies from individual to individual.

In the rabbit, in which its formation closely resembles that found in man, the depressor nerve arises from two branches, one from the superior laryngeal nerve and the other from the vagus. It is distributed to the proximal part of the aorta, where its sensory nerve endings are found. Stimulation of the peripheral end of this nerve has no effect; stimulation of the central end causes a fall of blood pressure and reflex (vagus) slowing of the heart. It is claimed that distention of the first part of the aorta will cause a drop in blood pressure through the action of this nerve.

The first clinical experimental study on the afferent cardiac nerves was that operation performed by Jonnesco in 1916 for the relief of pain in angina pectoris. Jonnesco[4] has been doing his operation of sympathectomy which consists of a complete, usually bilateral, cervical sympathectomy including the stellate ganglion, since 1896, during which time he has done over 200 for the relief of such conditions as exophthalmic goiter, epilepsy, migraine and glaucoma. It is of some interest that in 1923[5] he reported that in those 200 cases he had never seen any bad effects produced by this operation, and yet three out of the first six cases of angina operated on by him died very soon after operation and died a cardiac death. (Apparently a normal heart may get along with its sympathetic supply practically removed, whereas a diseased heart may be considerably embarrassed by such procedure.)

Since Jonnesco's first operation in 1916 there have been a number of attempts at the surgical treatment of angina which throw light on the afferent nerve supply of the heart. Jonnesco removed all three cervical ganglia and the first thoracic ganglion, and advised that this be done on both sides.

Brown and Coffey[6] of San Francisco were the first to attempt the operation on this continent. In their first case they decided to do the operation in successive stages in order to sever only such nerve pathways as were necessary, and as a first step they cut the sympathetic trunk below the superior cervical ganglion and the superior cervical cardiac sympathetic nerve. The patients had such relief from this that they dropped the idea of any more extensive operative procedure, although they have on their later cases removed the superior cervical ganglion. They have reported sixteen cases with two deaths, the other fourteen patients much relieved as a result of their operation.

Other surgeons, using some modification of the Jonnesco operation, have also reported successful results. The surprising thing has been the success achieved with the very different surgical procedures adopted. The superior cervical ganglion alone has been removed, the superior and middle ganglia have been taken out, and all three ganglia have been removed and these procedures carried out on the left or both sides with apparently a certain amount of success in any of these methods. Recently Swetlow[7] has reported the treatment of angina by paravertebral alcohol injections of the dorsal root ganglia. He has treated eight cases in this manner with prompt and satisfactory relief from pain, and with no complications or serious after effects.

The successful results following such varying technic make one suspect that in some of these patients the element of suggestion and the enforced rest during the postoperative period are partly responsible for the alleviation of the pain. Langley[8] has pointed out the physiologic error in these operations and suggests the section of the major and minor accelerator nerves which he admits would cut most of the efferent as well as the afferent sympathetic fibers, although in cats so operated on no bad effects were noted. In the Jonnesco type of operation there is no doubt an interruption of afferent cardiac fibers with resulting relief from pain but this same explanation can not apply to the high operation performed by Brown and Coffey. The success achieved by this procedure has been explained as being due to the cutting of the efferent sympathetic fibers that produce vasoconstriction in the aorta and coronary vessels. Although the existence of a vasomotor supply to these coronary arteries has not been entirely established in man, experimental evidence in lower animals would suggest their presence, and this would explain the beneficial results of this operation.

The other operation in anginal cases is to cut the afferent cardiac fibers associated with the vagus, the so-called depressor nerve, the nerve of Ludwig and Cyon. Wenckebach[3] has urged this procedure and he reports five cases from his clinic, in which Hofer had isolated and cut the depressor nerve with some relief. Just why Wenckebach, who has committed himself to Allbutt's theory of angina, should advocate cutting the nerve from the aorta that is supposed to reflexly lower the blood pressure when the first part of the aorta is distended, is hard to understand. This nerve would seem to perform a valuable protective function in anginal cases. The only objection Wenckebach raises to this procedure is the difficulty, in fact the impossibility, of recognizing the depressor nerve in a certain number of cases.

MacKenzie,[9] in an article written not long before his death from angina, criticized all these operations on the ground that, in the first place, the surgeon did not know exactly what he was cutting and, in the second place, the pain in angina is in itself a danger signal that may be most valuable to the patient. The attacks of pain are of such severity, however, and the existence of the patient rendered so miserable thereby that some relief from surgical procedure seems justifiable. The less extensive and less dangerous operation, such as that suggested by Brown and Coffey, would seem the procedure of choice, particularly since it has the further advantage that the sensory and accelerator fibers of the sympathetic are not disturbed. In some cases even further surgical interference may be required for complete relief of the pain.

SUMMARY

There are four conditions in which pain arises from the heart itself: simple fatigue, irritable heart, angina pectoris and coronary thrombosis. The important factors in the production of this pain are exhaustion of the heart muscle and increased excitability of the nervous system. The afferent pathways by which these impulses are transmitted to the central nervous system are not yet clearly defined, although afferent fibers undoubtedly accompany both the vagus and sympathetic efferent nerves. It must be admitted that at present no satisfactory explanation can be given of the beneficial effect of cervical sympathectomy in cases of angina, and no such explanation is likely until we know more of the cause of the pain and of the innervation of the heart and aorta.

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WHEN AND HOW TO PUNISH CHILDREN

Punishment involves pain. Parents should learn that one rule must be followed: The pain inflicted must be greater than the pleasure derived from a given act if the punishment is to be effective, state Dr. Smiley Blanton and Margaret Gray Blanton in Hygeia for October. The three types of punishment are physical punishment, acute psychologic punishment and prolonged psychologic punishment.

Physical punishment should be short and sharp and used for the purpose of giving the child a conditioned reflex, which is the most important method of learning with which the child is originally endowed. If the child's finger touches a hot stove, the hand is withdrawn. The next time he sees the stove, even though it is not hot, he remembers the pain and withdraws his hand. If the child is slapped on the hand when he reaches for something, the pain should be sharp enough that he will withdraw his hand the next time at the same place.

Whipping should be used rarely and should only be a sharp rap on the hand or the use of a switch or leather strap on the calf of the leg. Physical punishment should not be given before the second year or after the eighth year. Usually by the fourth year the child may be reasoned with. One of the most destructive things in connection with physical punishment is that many people use it as a threat and do not carry it out.

Punishment must be aimed to control a distinct situation. It must be adequate and it must be immediate on the first offense known to be an offense.

Prolonged psychologic punishment, which usually consists in pouting about the child's behavior is most destructive from the standpoint of mental hygiene. If the child is normal, he is at first distressed, then irritated, then indifferent and finally antagonistic. If the punishment is effective and the distressed stage is retained, which will occur only with an abnormal child, the child becomes moody, depressed, an anxiety type and all sorts of disturbances in late adolescence or adulthood may result.

Praising the successful act and ignoring the unsuccessful is often found to be the most effective way to get results, as attention is one thing all children desire. Parents must have a definite program; children cannot be brought into the world and handled as an emergency problem.

NURSE PLAYS BIG PART IN MATERNAL WELFARE

The value of sound medical advice for the expectant mother is coming to be more generally realized. The nurse plays an important part in teaching and helping the mother during this period, says *Hygeia*, the health magazine published by the American Medical Association.

While the nurse must work with and under the instructions of the physician, she can go into the home and explain more fully his directions and can see that they are carried out. Since few women can afford or need the services of a full time nurse for the whole period of pregnancy, and since few physicians have the time to give thorough instruction to the expectant mother, the visiting, hourly and public health nurse have here a large field of usefulness. However, the work of the nurse must be only supplemental to the regular visits to the physician.

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EDITORIAL

A NEED IN OUR IMPROVED HOSPITALS

With the coming of standardization, our hospitals in the Northwest made one tremendous leap in their service to the patient. There is one need that no attempt has been made to fill. That is the aftercare and supervision of underpriviliged, often underintelligent patients who do not know how or cannot fully carry out instructions. Sometimes this is because they have not the means, often because they have not the intelligence.

Medical treatment has advanced far, specialization has offered patients much, but the patient is to the physician a pathologic phenomenon, isolated from his habits, his family and his community influences, all of which have contributed to his pathology. When the patient enters the hospital he finds himself in a new and strange scene at a time when his nature and and psyche are subject to sharp reactions, accentuated, indeed, by his disease. He faces a readaptation and should have an understanding of the responsibility of the hospital to the patient. Consider the paid professional worker. She comes to the hospital and plans the social education or repair of the patient through a study of his environment. Through cooperation with his physician she learns more of his needs and rounds out her plan of action. Where this service we have in mind is not supplied to the patients, defects in service result. To enumerate, first, in incomplete recovery of the patient; second, in incomplete medical service; third, in incomplete service from the institution in question; fourth, a physically and morally inadequate citizen as a result of the other three inadequacies.

This work first came into being about 1650 at the hands of Theopraste Renaudot, a physician from Louvain, who created a dispensary on an island in the Seine in Paris. He established follow-up visits, systematized return of the patients, established a miniature employment bureau for the production of an income for convalescent poor, and established a newspaper for propaganda. He was bitterly attacked by his contemporaries and soon had to leave Paris, a sadder, poorer but wiser man. About the same time, St. Vincent de Paul introduced women of wealth as patronesses in the hospitals, whose duty it was to make both in and outdoor visits on patients. However, the turbulent days France lived through caused these provisions to be lost sight of, along with the changing social and political conditions. The farseeing wisdom of the two men is seen in the records kept by them, now turned to value in social service.

In modern times it was again our old friend William Osler who first applied these principles. He found that the majority of clinic patients have little means for payment of home or afterhospital care, though self supporting when in health. He, therefore, laid the foundation for home aftercare from the Out-Patient Department of Johns Hopkins Hospital. His understanding of the part played by unsanitary conditions, poor food, crowding, and unfavorable occupation upon the ultimate outcome brought about the introduction of medicosocial follow-up workers in his hospital. Thence this idea and service spread to Massachusetts General Hospital and from these two to many others. While we have no large dispensaries in the Northwest, we nevertheless have hosts of patients who leave the hospitals undrpriviliged and helpless if left to themselves, and it is for these this plea is made.

Some of the services these social workers can render are, first, a great help in the convalescent and postconvalescent rehabilitation of the patient. They can find for them homes during their periods of incomplete recovery. Such women can relieve the hospital and the physician of the trouble of finding foster homes for babies by establishing various agencies for adoption. These women can, through the social service bureau or through their own efforts, supply the family with such relief as food, fuel and rent. They can find permanent refuges for chronic invalids, they can establish vocational bureaus where the disabled are taught new occupations. They will relieve the doctor and the hospital of the many irksome tasks in connection with finding legal agencies when certain claims need looking up. If possible, such women should know foreign languages, though the role of interpreter does not seem to be as important in the Northwest as elsewhere. It would be the function of such a service to aid in travel those patients who come from a distance or are en route from one city to another. These workers should establish recreation centers for invalids and open air schools for tuberculous or choreic children. Mental hygiene is perhaps the most important item in the social worker's activities, for many diasabilities are complicated by mental symptoms, or are themselves the result of mild mental alienations. Every well organized hospital should have a competent neuropsychiatric social worker on hand as the best means of improving the mental health of its patients.

The social worker's function is a thing apart from that of the physician. She learns by patient interview and home visits the conditions in the life of the individual which provoke and foster abnormal mental trends. Through a well worked out plan, including correction of hygienic conditions in general, diet in particular and especially a well chosen occupation with ample rest, the patient learns to live and to know his limitations and how to meet them. In a homely way it may be said that the patient is taken out of himself under the skilled guidance of a friendly visitor who does this in an unostentatious manner, and with an understanding of his malady.

The principles governing social work may be enumerated as follows:

1. The discovery of and reporting to the physician facts regarding the patient's environment and personality which have a bearing on his physical condition.

2. Overcoming obstacles to successful treatment as exist in or arise from his home or his work.

3. Arranging for care which supplements that of the physician when it is necessary and this it may be said is very frequent.

4. Education of the patient so that he may intelligently take advantage of the physician's program.

There is no better illustration of the value of this service than the widespread prenatal care now carried out. Another important, and not yet fully worked out field for the social worker, is in connection with the luetic patient. He is naturally secretive and morally dangerous and difficult. Most of them drift away from treatment, causing failure of cure, often even of amelioration, and then these patients infect others.

F. E.

UNNECESSARY NOISES AND HEALTH

Noise is one of the causes of disease which has received too little attention from writers. Perhaps the most obvious effect of noise is observable in the production of deafness and its attendant vertigo in employees in boiler factories and similar places. From such extreme results down to mild nervous shock, the gradation of possibilities is continuous. Unnecessary, avoidable noise should be abolished by enforceable and enforced city statutes. Its pernicious influence is ever present from the cradle, throughout the span of the longest life, to the grave. The newborn babe is roused from its slumber and disturbed by untoward sounds from without, becomes fretful and peevish and the more easily a prey to digestive disorders and infections. The invalid of any age finds it difficult to escape from noises, save by going long distances in the country to remote places. The quiet student in his library, burning the midnight oil and working, perhaps, on a problem which may benefit mankind, has his attention distracted by harsh sounds from without. The aged person, sinking into a gradual decline which ought to come as gently as the shades of midsummer twilight, is startled from his dreams by raucous blasts of sirens and the roar of speeding trucks.

The family, whose home is near a carline or on a busy street, is constantly disturbed by the, in part, unavoidable noise of street cars and other forms of traffic, supplemented by a thousand unnecessary and easily preventable sounds, of which none are more disturbing than the vicious honking of the auto horn, activated by a hoodlum driver and enhanced by the shouts of a "bunch" of eager hoodlum companions who may be and often are juvenile members of otherwise good families, in which training in regard to the decencies and rights of others has not been enforced. To such persons enjoyment of pleasure seems to be in direct proportion to the discomfort they inflict on others. The cutout, more especially that of the motorcycle, is another abomination which often opens suddenly and unexpectedly and sends many of its victims to the verge of hysteria. Not infrequently the cutout is a direct cause of accident through the production of fright, confusion and resulting misstep of, not only elderly persons, but youths and children. Often the cutout, both of the auto and the motorcycle, is opened so that the antics of pedestrians may amuse the driver.

Not least of the disturbing noises which afflict the present generation are those resulting from the abuse of the radio. As these comments are being prepared, the plays of the world's series baseball game are being announced through a loud speaker, in a window of the building opposite that of the writer. These sounds are distracting the attention of hundreds of tenants in neighboring office buildings who in all probability have no interest in the titanic (?) struggle going on in St. Louis and who would much prefer to be permitted to give full attention to their own affairs. One can think of a thousand other forms of useless noises which should easily be prohibited and many of which should lead to fines or even imprisonment of their perpetrators.

There are sufficient unescapable noises to make it surprising that even a good natured and tolerant sentiment permits these invasions of the rights and liberties of the general public. Regulation of radio, phonographs, streetcar gongs and automobile sirens is easily possible. All such sounds are largely unnecessary. A good automobilist will sound his horn but rarely, sometimes not once a week. The smart-Alec, clear-the-road, get-out-of-the-way-for-me, I-am-coming driver, thinks it necessary to toot his horn every few seconds. The former is seldom in trouble and rarely injures anyone because he is equally considerate of other rights of the public. The latter is often in trouble and gets others into trouble because his manners in the automobile but reflect his lack of common sense, courtesy and good judgment. When will our city officials learn, not only that unnecessary noise is dangerous, but that enforceable ordinances can eliminate much of it?

AUTOMOBILE FATALITIES

That familiarity breeds contempt is well illustrated by the present indifference to the astounding fatalities from the automobile juggernaut which daily crashes through the streets of our cities. If it were announced that 4,162 deaths had resulted from some great convulsion of nature or as the result of a battle, the nation would stand aghast with horror, but scarcely a second thought is paid to the report of such a holocaust from the destructive automobile as announced by the Department of Commerce from Washington, which occurred in 78 of our large cities during the eight months period from January 3 to September 11. The report groups these fatalities in four weeks periods, the smallest being 350 during March and the largest 560 in the period ending September 11, the number for the corresponding four weeks period of last year being 521. Naturally the largest number of fatal accidents were reported from New York City with 663, and Chicago with 435, the next in order being 203 for Detroit and 185 for Philadelphia. Reports from the Pacific Coast states show that during this period there were 148 fatalities in Los Angeles, 77 in San Francisco, 37 in Seattle, 25 in Portland, 19 in Spokane and 17 in Tacoma.

A list is given of 33 cities, ranked according to the mortality rates per 100,000 population established during this period, showing that Kansas City, Kan., with only one fatality had a death rate of 1.2, while Indianapolis with 59 ranked 33, with a death rate of 23.3. In the 78 cities under consideration there was an average of more than 16 deaths per day which is equivalent to an average death rate of 18.9 per 100,000 population. While this censure against the automobile is appalling, and cannot too often be brought to the attention of everyone interested in the use of this necessary vehicle, no means of remedying this frightful array of fatalities is offered. The function of this department of the government is merely to present facts. If there are any available methods to remedy the situation either nationally or locally, the authorities have a job laid out for them in putting into effect such remedial measures.

THE TUBERCULOSIS DECREASE

It is satisfactory to observe the official announcement of the decreasing death rates from tuberculosis which have been presented by the Department of Commerce. Comparing the death rates in all forms for 1900 with those of 1924 in the registration area, it is announced that the decline has ranged from 73 per cent for females under 1 year of age to 37 per cent for females of the 15-19 years period. During 1900 the death rate per 100,000 population was 194.4 for males and 182.8 for females, while in 1924 these figures have decreased respectively to 89.7 and 77.2. The 1900 rate was greatest under 1 year, being 349.5 for males and 249.8 for females, these figures in 1924 being reduced to 94.4 and 78.7. Among adults the highest rating in 1900 was for 30-34 years, being 298.3 for males and 282 for females, these figures in the later period being reduced to 121.5 and 104.7. It is interesting to observe that similar rates of decline are also reported from England and Wales, although our rates of decline for the most part are more marked. Thus the greatest per cent difference up to age 55 was for males aged 5-9, the respective rates for the two countries being 37 for England and Wales and 15 for the United States. The published details present the rates of decline for ten year periods for age groupings up to 75 years, the details of which cannot be further elaborated except to state that all reports show a steady decline of death rates. Attention should be called to the fact that such increasingly satisfactory results in this country have been accomplished largely through the financial returns of the annual sale of Christmas seals. All physicians are interested in promoting improvements of this character, and will be prepared to assist in continuing the same during the sale of these seals during the approaching holiday season.

PERIODIC HEALTH EXAMINATIONS

During the past generation, the average length of human life has been increased about fifteen years. This conservation of life has been due chiefly to the prevention and decreased mortality of the infectious and contagious diseases and the decrease in infant mortality. A study of the mortality statistics gives very little comfort to the individual of middle life. His chances of living to a ripe old age are no better, or possibly not so good, as those of his ancestors one hundred years ago. So, if we are to still further increase the average length of life, we must apply the principle of preventive medicine to the diseases of adult life which at present comprise about one-half of the mortality statistics. It was due to a recognition of this fact that the American Medical Association has proposed to sell to the profession and the public the idea of the "Periodic Examination of the Apparently Healthy Person."

In order to call attention of the physicians in its state to the need for this examination and to stimulate them to prepare for it, the Washington State Medical Association has purchased, and is sending to every member in this state "A Manual of Suggestions," recently published by the A.M.A. This is a very valuable manual, covering a history of the movement for periodic examinations of the apparently healthy person, suggestions relative to the history, and a discussion of the interpretation of the physical findings, a table of standard weights and heights and hygienic advice to the healthy patient. Considerable effort and money have been expended in putting out these manuals, and it is to be hoped that every physician receiving one will read it carefully, so that he can render real service to those applying for this examination. There is no more effective way by which the medical profession can promote this as a public movement than by rendering high class service.

MEDICAL NOTES

OREGON

Elks Aid Hospital. The Elks Association of Oregon has determined to raise the sum of $18,000 by public subscription, in order to furnish completely one floor in the new Dorenbecher hospital for children at Portland.

Condemns Isolation Hospital. Dr. William Levin, of the Oregon state department of health, following a recent inspection of the Klamath Falls isolation hospital, has condemned the institution as being unsanitary.

Lectures on Tuberculosis. Dr. Ray Matson, of Portland, gave a lecture on the subject of tuberculosis at the annual meeting of the Lane County Health Association, at Eugene.

Medical School Growing. Approximately 230 students have registered for the present session of the University of Oregon medical school. The clinical facilities have been greatly increased by the opening of the Dorenbecher hospital, which is an integral part of the medical school.

Bequest to Promote Eugenics. The will of the late Dr. L. A. Owens-Adair has set aside the major portion of her estate for the purpose of erecting an Institute of Eugenics at Warrenton. She also bequeathed property in that city as a site for a new city park.

Physician Loses Appeal. The United States Supreme Court has denied the appeal of Dr. Frank C. Hart, of Portland, who was convicted in the Federal Court for the violation of the Mann Act. He must serve a sentence of five years in the Federal penitentiary.

Dr. W. J. Covington, of Salt Lake, Utah, regional director of the International Health Board of the Rockefeller Foundation, made an inspection, in October, of the Coos County health unit, whose activities are under control of the Health Board.

Dr. John M. Simpkins, formerly of Salt Lake, Utah, has taken over Dr. H. M. Peery's interest in the partnership with Dr. A. B. Peacock at Marshfield.

Dr. A. J. Fawcett has located for practice at Independence.

WASHINGTON

Addition to Hospital. The new wing, which was recently built at the Tacoma General Hospital, will increase the bed capacity of the institution to 250. The addition is five stories in height, and is of fireproof concrete and brick construction. A three-story dormatory for employees has also been erected.

Sanipractic Dipioma Mill Dissolved. The decision of the Superior Court of King County, forfeiting its corporate rights and dissolving the "American University of Sanipractic," has been affirmed by the Supreme Court. Thus ends the career of this diploma mill. Revocation of licenses issued on its fradulent diplomas was also sustained by the court. The last sentence of the court decision states, "The applicants by issuing the diplomas, and the recipients, by filing them with the License Department, were therefore guilty of fraud and a violation of the law."

TACOMA DESIRES HOSPITAL BASE. Dr. E. A. Rich, commanding officer of the United States reserve hospital unit, has begun a movement to make Tacoma the permanent headquarters of General Hospital No. 141 of the United States army reserve corps.

WOMEN'S WARD CONDEMNED. Dr. E. T. Hanley, commissioner of health of Seattle, has condemned the municipal women's quarantine ward for venereal diseases as being unsanitary and totally unfit for use. He offers the substitution of a parole system and an out-patient clinic for women suffering from venereal disease.

HOSPITAL ENLARGED. Dr. A. Bronson is adding eight rooms to his private hospital at Renton.

PHYSICIAN'S OFFICES PROVIDED. The upper three floors of the Becker Bldg., at Aberdeen, have been constructed with a view to the needs of physicians and dentists, several of whom have already moved into the new suites.

SERBIAN DECORATION. Dr. Edmond Klancke, who formerly practiced at Port Gamble and is now doing postgraduate work at Harvard Medical School, has received a Decoration of the Red Cross, first class, from the Serbian government for his services in Montenegro after the armistice.

CHILD HEALTH AUTHORITY SPEAKS. Miss Grace Abbott, chief of the children's bureau of the United States Department of Labor, recently visited the largest cities of Washington in the interests of the work being carried on under the Sheppard-Towner Act. In Seattle and Spokane she addressed interested groups of physicians and public health workers upon the subject of child hygiene.

PHYSIOTHERAPY LECTURES. Dr. Frank B. Granger, of Boston, Mass., instructor of physiotherapeutics at the Harvard Graduate School of Medicine, conducted a course in physiotherapy for practicing physicians at the Tacoma General hospital September 20-24. Dr. Granger inaugurated and directed the work in physiotherapy in the United States Army during the World War.

LEWIS COUNTY MEDICAL SOCIETY at its meeting in Chehalis October 11, was addressed by Dr. William Speidel of Seattle. His subject was blood transfusion.

DR. S. H. TASHIAN, of Seattle, has taken over the practice of Dr. A. F. Barnett at Dayton. Dr. Barton has gone to Philadelphia for a course of postgraduate study.

CHELAN COUNTY MEDICAL SOCIETY, at its meeting at Wenatchee October 6, was addressed by Dr. H. G. Willard, of Tacoma, president of the Washington State Medical Association, and Mr. Robert Jones, Secretary of the Public Health League of Washington. Scientific papers were read by Drs. A. C. Crookall and Brien King of Seattle.

DR. GEORGE L. ROUTLEDGE has assumed charge of the practice of Dr. Dewey at Okanogan. Dr. Dewey has been forced to take a vacation on account of ill health, and will spend the winter in California.

DR. J. L. STAUFFER, formerly physician in the United States Public Health Service at Yellowstone Park, has opened an office in Spokane.

DR. WILL H. PAYNE has located for practice at Toppenish.

MEDICAL WEDDING. Dr. Clark Goss, of Seattle, was married to Miss Charlotte Lathrope Smith, of Holyoke, Mass., Sept. 23.

IDAHO

TO STUDY IN EUROPE. Dr. F. M. Ray, of Pocatello, left on Sept. 27 for Vienna, where he will engage in postgraduate study.

NEW LICENSEES ANNOUNCED. The following physicians have obtained licenses by reciprocity to practice medicine in Idaho: Dr. J. McKelway, Orofino; Dr. Joseph J. Walker, Sandpoint; Drs. John A. Nelson and Alfred Smith, Dreary.

MONTANA

HOSPITAL DEDICATED. The new Kennedy Deaconess Hospital, at Havre, was officially dedicated October 24. The institution is under the direction of the Methodist church.

NEW HOSPITAL UNDER CONSTRUCTION. The Billings Deaconess Hospital, now under construction, will be completed in the near future.

RESIGNS FROM VETERANS' BUREAU. Dr. A. P. O'Leary, who for the past eighteen months has been general examiner at the Helena office of the United States Veterans' Bureau, has resigned.

DR. TOWNE, a graduate of Kansas University medical school, has taken over the practice of Dr. F. T. Oberg at Belgrade.

OBITUARIES

DR. OTIS DOLE BUTLER, of Independence, Ore., died Sept. 26 at a Salem hospital, aged 64, from an infection which had resulted from a small wound of the hand, received while performing an operation a few days before. He was born at Independence in 1862, and graduated from the Willamette Medical College in 1887. He had practiced in his native city since 1887.

DR. JOHN H. MCVAY, of Hood River, Ore., died at his home Oct. 8, aged 59 years. He was born in 1867, and was graduated from the Chicago Homeopathic Medical College in the class of 1894. Despite a condition of semiinvalidism, which he suffered as a result of an injury to his back in 1916, he continued his pratice until a few months ago.

DR. SARAH J. DEAN, of Seattle, Wash., died at her home Sept. 30, aged 85 years. She was born in

1841, and attended the University of Michigan medical school, graduating in 1880. She was a resident of Seattle for 37 years, during most of which time she was engaged in practice.

Dr. Charles P. Jento, of Tacoma, Wash., died Oct. 1, aged 59 years. He was born in Brockville, Canada, in 1868, and graduated from McGill University in 1890. He was formerly prison surgeon at the United States Federal Penitentiary at McNeil Island. He recently served as ship's doctor on the British vessel Protesilaus.

Dr. Ralph S. Hedges, of Lewistown, Mont., died suddenly of heart disease October 14, aged 58 years, while attending a meeting of the local American Legion. He was born in 1868, and graduated from the University and Bellevue Hospital Medical College in 1899. During the World War he served in the United States Army medical corps in Siberia.

PUBLIC HEALTH LEAGUES

IDAHO

THE MEDICAL PROFESSION VERSUS THE INDUSTRIAL ACCIDENT BOARD

The medical profession of this state is now engaged in a death struggle with the Idaho Industrial Accident Board over the fee bill coming under the Workmen's Compensation Law. Idaho's Industrial Accident Board issued a red-covered pamphlet, giving the new set of fees to be followed by the medical profession dated September 1. Because of the lowered fees and inconsistencies the Board is evidently retaliating against the profession for the defeat of their socialistic attempt to establish state medicine at the 1925 session of the legislature. This attempt upon the part of the Board was to put through an amendment of the compensation law, placing all physicians and surgeons together with all hospitals under the jurisdiction of the Industrial Accident Board. The schedule as issued was rejected by the profession at their state meeting which was held in Sandpoint September 2-4. In the rejection the profession is only asking for a square deal, and serious objection was made to the manner in which the new fees were adopted as well as the boundless red tape that surrounds its administration.

In December, 1925, the Board called the insurance carriers of the state handling compensation insurance together for the avowed purpose of conferring on a new schedule or a possible revision of the old one. The old line carriers and self-insurers in open meeting stated that they were satisfied with the fees already in force, and that the services of the physicians under the old schedule were satisfactory but that controversies had arisen in a very small number of cases. Recently one member of the Board has madly and emphatically told the insurance representatives present that whether they liked it or not they were going to have a new schedule.

The Board members announced that the physicians of the state would be called into conference at a later date. Representatives of the profession contacted the Board, assuring them that the physicians had already recognized the fact that something was going to be done and had in convention assembled empowered the President of the association to appoint a committee to confer with the insurance carriers and the Board. This committee by resolution had full power to act for the medical association. Dr. G. N. Pond, at that time President of the association, appointed a committee after this assurance by the Board that they would recognize the committee and that the Board was to notify them of the date of conference. Disregarding this promise, the Board ignored the committee and called all the physicians of the state for a conference (so-called). This conference or meeting was to be held in Boise on February 11. The President of the Board, when asked about the reversal of form, stated that the "Board would not recognize the medical organization (society or league), but that they were dealing with the individual physicians. Furthermore, that the association did not represent the physicians of the state."

The organization called a preliminary meeting for February 10 in order that the physicians could be advised of the attitude of the Board and what they intended to do. An air-tight organization was perfected that day. The so-called conference was held February 11 in Boise and lasted twenty minutes. The President of the Board emphatically stated that they "were going to cram the California schedule down their throats." Those present rose up as one man and as emphatically told the Board that they would not work under the California system. Right there and then the Board backed down. Its President stated they would appoint a committee from the physicians to work out a new schedule in conjunction with the insurance carriers. It was pointed out to them in no uncertain terms that the insurance carriers were allowed to select their committee, therefore the physicians of the state claimed they were capable of picking their own committee. The Board again backed down, allowing the physicians to select a committee from those present. Drs. J. L. Stewart of Boise, D. L. Alexander of Twin Falls, C. C. Conant of Weiser, Alexander Barclay of Coeur d'Alene, and D. E. Cornwall of St. Maries were selected by the physicians present to represent them before the Board in conjunction with a like number from the insurance carriers of the state.

The committee of medical men and the committee from the insurance carriers met on the afternoon of February 11, electing Dr. J. L. Stewart as chairman of the general committee. The joint committee wrestled with the problem all afternoon and decided to use the Utah schedule as the framework or skeleton in building a schedule of fees adaptable to conditions in Idaho. They then met with the Industrial Accident Board and were assured by them that this was satisfactory. The joint committee worked all night and again conferred with the Board before noon on February 12, as some of the members desired to take the noon train for their homes in northern Idaho. Before adjourning a subcommittee of physicians and insurance carriers was selected from the general committee to make a further study to work out details and to complete the job.

The subcommittee worked every day for almost three months, working out the details and the rules. Correspondence was had frequently with the members living at a distance from the general committee. In May the schedule was completed and submitted to the Board.

After the schedule was submitted, nothing further was heard from the Board until the red pamphlet was issued soon after September 1. The chairman and none of the members were consulted. Evidently a new schedule was compiled by the Board. On September 3 and 4, physicians of the state received a red-covered pamphlet which upon investigation proved to be the long-looked-for schedule. However, it was one adopted by the Board. It had no resemblance to the schedule of fees as submitted by the committee.

The distribution of the schedule was held up until after September 1, when the Idaho State Medical Association was to hold its annual meeting, regardless of the fact that the schedule was to go into force and effect on September 1. Some copies of the schedule were received the last day of the meeting. It was brought to the attention of the house of delegates of the general meeting and was unanimously rejected by the association. A meeting of the committee handling this problem will meet in Boise October 29 and further plans outlined in dealing with this bitter controversy with the Board. Physicians of the state are only asking for a square deal but have failed to receive it. One Board member recently made the remark, "that they were educating the physicians." Evidently he did not figure that two parties could play the same game.

LEGISLATIVE PROPOSALS

Present indications point to the introduction, at the next session of the Legislature, of bills calling for a separate license board to handle physio-electro therapeutics. This is being sponsored by the chiropractors. Another proposal is to allow drugless healers the authority to use drugs and the right to do major surgery. A measure has been prepared limiting the fees to be charged by physicians in private and industrial cases. Another drastic proposal and one that is being sponsored by the cults is to allow all licentiates of the healing art to practice in all hospitals of the state.

WASHINGTON

CARAVAN MEDICINE

The president of Washington State Medical Association, Dr. H. C. Willard of Tacoma, is arousing interest in the organization and increasing membership through a system of medical caravans. When a county society sets aside one of its meetings for a program from the state office, Dr. Willard arranges to get as many as possible of the chairmen of the various committees present and takes along physicians from other societies for good measure. At a recent meeting of the Lewis county society fourteen men from other sections of the state were visitors and many of them assisted on the program for the evening.

A number of carloads of physicians have gone with him to other meetings, and it is expected that this system will be maintained throughout the year. At the invitation of President Willard one or more representatives of the Public Health League are present at these medical sessions, and the opportunity is given of explaining the work of the League.

A SPEAKERS' BUREAU

The state medical association is getting a speakers' bureau established, so that any society desiring a speaker may do so from state headquarters. A complete list of papers, covering various medical topics, and state-wide in its personnel, is made available to all societies. It is believed that this will mean better county programs and result in added interest.

ONE THOUSAND SPEAKERS WANTED

Preparations are being made at League headquarters to inaugurate a huge public speaking campaign throughout the state. Every luncheon club, every chamber of commerce, every women's club, in fact, every organization in Washington will have the opportunity, according to plans, to hear at least two authoritative health talks during 1927. A bulletin will soon be issued to physicians, asking that addresses on health topics, written in terms the public can quickly understand, be prepared. After these are ready, a complete list of the entire speaking force of the medical profession will be arranged and made available to the various organizations. It is hoped that at least 1,000 such talks may be delivered during the year.

REPORTS OF SOCIETY MEETINGS

IDAHO

PORTLAND CITY AND COUNTY SOCIETY

Pres., T. H. Coffen; Secty., R. M. Wellington

A meeting of Portland City and County Medical Society was held at Portland Hotel, Portland, Ore., Oct. 6, Dr. T. Homer Coffen presiding. Minutes of the previous reading were read and approved.

The first business of the evening was a talk by Dr. Abele of the City Health Department relative to the inadvisability of closing the public schools and fumigating the same for sporadic appearance of infantile paralysis.

Dr. G. Norman Pease announced the first meeting and tournament of the Portland Physicians and Surgeons Golf Association.

An address was delivered by Dr. M. E. Steinberg, presenting and demonstrating a "New Method of Colostomy." This was discussed by Drs. Black, Pease, St. Pierre and Bettmann.

A paper was presented by Dr. T. W. Adams on "Backache and its Relation to Gynecology and Obstetrics." Diagrams and lantern slides were shown, illustrating the various causes of backache. The paper was discussed by Dr. McClure from the orthopedist's point of view and by Dr. Sears from the standpoint of the medical man.

Announcement was made of the next meeting to be held with members of the society living in Hillsboro for October 20.

A meeting of Portland City and County Medical Society was held Oct. 20, Dr. T. Homer Coffen presiding. The minutes of the previous meeting were read and approved.

The paper of the evening was read by Dr. C. U. Moore, "Rickets of the Lower Extremities." It dealt with the various phases of rickets and the different forms of treatment, illustrated with lantern slides.

Drs. Akin and Dillehunt discussed points of interest to the orthopedist. Dr. Bettman presented some views relative to the Doctors' Exchange.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., W. C. Woodward; Secty., O. H. Christoffersen

A general meeting of King County Medical Society was held at Seattle Oct. 4 at 8:15 p. m., with President Woodward in the chair. Minutes of the previous meeting were read and approved.

Applications for membership of Drs. C. A. Andersen, H. A. Schoffman, P. T. Scott and B. E. Washburn were voted on, and each was duly elected.

Applications for membership were read of Drs. J. M. Bowers, A. J. Bowles, Alexander Grinstein, H. H. Kretzler, G. R. Lunger, J. A. McKay, C. Melgard and R. H. Mellen.

The paper of the evening was by Dr. C. H. Hofrichter, "Observations in Disturbed Glucose Metabolism, with Etiologic Significance." It was illustrated. An approach to an understanding of the metabolic functions of the body may be made through a number of different channels, and according to the experiences encountered in the particular route of choice, one's conclusions will be formed. The views of pathologist and chemist were described and illustrated. In observing numbers of cases passing through these metabolic transitions, both from a clinical and laboratory standpoint, certain characteristics have presented themselves. The author discussed various phases of the problem under the headings, abnormal metabolism of glucose, disturbance of glucose metabolism without typical signs of diabetes mellitus, disturbed glucose metabolism in arthritis, arteriosclerosis in association with disturbed glocose metabolism, influence of the nervous system on metabolic activity, the association of carcinoma and disturbed glucose metabolism, the influence of acute infections upon glucose metabolism, response of treatment as portrayed through the test meal.

In discussion Dr. L. J. Palmer congratulated the essayist on the acuteness of his observation and drew attention to the value of the glucose tolerance test, with explanations as to its application and limitation of its interpretation. The paper was further discussed by Drs. D. H. Nickson, C. F. Davidson, R. B. Tracey, C. R. Castlen and C. E. Watts.

A meeting of the Medical Section of King County Medical Society was held Oct. 11 at 8:15 p. m., with Pres. L. J. Palmer in the chair.

The first paper was read by Dr. R. E. Mosiman on "The Correlation of the Pathologic and Chemical Findings of Thyroid Disease." It was based on a review of literature and the author's experience in examinations of thyroid tissue from a pathologic standpoint. Under physiology of the gland he discussed its regulation of heat production and its construction of physiologic iodine from inorganic iodine salts. The pathologic changes in thyroid disease were presented, being classified under tumorous and nontumorous. The changes under each were detailed. The clinical symptoms of the thyroid disease were briefly reviewed.

Dr. J. C. Moore read a paper on "Goiter." He stressed the importance of careful examination, including the history, physical and laboratory examinations. He gave a classification of goiter under five headings and discussed the characteristics of each. He stated that 2 per cent of his series were malignant. He prefers ethylene and oxygen for anesthesia with preliminary narcotic. Dr. J. T. Mason discussed the papers.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. F. Dodd; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in its rooms, Tacoma, October 12, 1926, Dr. E. F. Dodd in the chair, Dr. J. B. Robertson acting as secretary pro tem.

Two clinical cases were presented, as follows: Dr. Pfeiffer presented a case of ulcer of the right ankle and of the left leg, of long standing, in which he had been unable to secure healing, although all the usual methods had been employed. Skin grafting and pedicle grafts had been used, with only partial success. One week ago periarterial sympathectomy was done on each femoral artery, following which there was a distinct rise of temperature in the limb, and improvement in the ulcers has been very marked. Dr. Whitacre discussed the case, giving some of the indications and contraindications for such an operation for leg ulcers.

Dr. H. J. Whitacre presented a case in which some two years ago a mole had been too superficially removed from the back. There had been subsequent operations and x-ray treatments of the condition, but all had not stopped the spread of the growth, which was demonstrated by Dr. Scott to be a large spindle-celled sarcoma. Metastatic nodes were evident in the axillae, the superclavicular region and elsewhere. A warning was again sounded against tampering with moles unless the excision be complete and done by cautery. The case was discussed by Drs. Scott, MacLean, and others.

A short talk was given by Dr. Ralph B. Eusden on "Recent Adventures in Boston Surgical Clinics." A summary description of Cushing's Clinic and his work in neurologic surgery was given, emphasizing the diagnostic and postoperative phases, with special attention to protective and antishock measures.

The orthopedic and fracture services of Boston Children's Hospital and Massachusetts General Hospital were reviewed, with emphasis on the trend to conservatism in fracture care. The Gynecological Clinic of Graves was mentioned, with the same emphasis. The management of thyroid cases at the Lahey Clinic and Cleveland Clinic were compared, with deep impression as to diagnostic effort and the protective measures obtained by heat-light-electricity against shock and postoperative discomfort.

The opportunity for consultation, especially at Massachusetts General on the fracture service seemed to be overexercised, with results no better than are to be seen in the better hands locally. The definite trend toward the combined use of radiotherapy and surgery in malignancy of the cervix and the great interest in the study of the physiology of the liver and gallbladder were additional high points.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., J. T. Dowling; Secty., M. J. Morris

The monthly meeting of the Puget Sound Academy of Ophthalmology and Oto-Laryngology was held at the Virginia Mason Hospital, Seattle, October 19. Dr. Chase called the meeting to order at 8:00 p. m.

This meeting was devoted to the exposition of clinical cases.

Dr. W. F. Hoffman presented a case of sarcoma of the ciliary body, the upper part of the iris and presenting itself in the anterior chamber. This was discovered during routine examination. There was no refractive change. The growth is as yet small, larger, however, posterior to iris than anterior, as shown by the shadow of transillumination. Enucleation will be performed immediately.

Dr. Connor Gray showed a fifteen-year-old girl with congenital cataract in each eye. She has vision of 15/40, is in the eighth grade at Sight Saving School and happy. No surgical interference is indicated.

Dr. Gray's second case was that of a man with an eye injury. When first seen the right eye was red, anterior chamber shallow. Myopia of three diopters was present after examination, although several previous examinations had shown the patient to be ammetropic. In discussion of this case, Dr. Wurdemann called attention to the stretching of the zonule of Zinn, which permits the lens to come forward, causing a low degree of myopia. He also pointed out indistinct degenerative changes in the macula, which would become more prominent later.

Dr. F. P. McNamee presented a case of saddle deformity of the nose. Before operating for the deformity, her marked ozena was treated. She was given three or four grains of potasium iodide three times daily for two months. This created a mild rhinitis which improved her ozena.

Dr. McNamee's second case was a child, from whose esophagus an open safety pin had been removed.

Dr. Hoffman called attention to the American Board of Ophthalmology and the American Board of Oto-Laryngology which will hold examinations in Spokane in July of this year. He strongly urged the members to avail themselves of this opportunity.

Twenty-four members and five visitors were present. There being no further business to come before this meeting the same adjourned at 9:45 p. m.

AN AID TO THE MEDICAL PRACTITIONER. Physicians treating venereal disease cases have frequently expressed a need for a pamphlet containing instructions and advice to be given to venereal disease patients. Due to the nature of these diseases and the regimen which proper treatment requires, the need for such a publication has long been apparent. Some time ago the U. S. Public Health Service prepared a pamphlet, known as "Important Confidential Information" expressly for this purpose. The leaflet is in two parts, one dealing with gonorrhea and the other with syphilis. Advice is given among other points on the following: Importance of continuing treatment until cured, proper diet while under treatment, proper care to prevent the spread of the disease, the futility and danger of quacks and self treatment, sex conduct and marriage. Many physicians have found this publication a valuable aid in securing the cooperation of the patient while under treatment and also as an aid in holding the patient until cured or rendered noninfectious. Copies of this publication are available from State Departments of Health or they may be secured by writing to the U. S. Public Health Service, Washington, D. C.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

THE THYROID GLAND. By Professor Charles H. Mayo and Professor Henry W. Plummer, University of Minnesota, Mayo Foundation, Rochester, Minnesota. Baumont Foundation Annual Lecture Course IV. 1925. Cloth, 83 pp. $1.75. C. V. Mosby Co. St. Louis, Mo., 1926.

In the first part of this little volume Dr. Mayo summarizes clearly and concisely the main facts in relation to the history, anatomy, physiology, etiology, chemistry, bacteriology and habitat of goiter, and closes with a discussion of the parathyroids. All this is admirably done by this master of surgery, especially goiter surgery.

The second part is notable because of the unusual lucidity of Dr. Plummer. Although universally acknowledged as the leading authority on goiter from a a medical standpoint, he has never before discussed the subject in so plain and understandable a manner. Nothing could be more simple than his classification, and the same may be said for his pathology. But three forms of goiter are recognized. First, endemic goiter due to iodine deficiency. Pathologically this is called hypertrophic goiter, owing to increase in the size of the cells of the acini. Following hypertrophy, nature's attempt to compensate for lack of iodine, secretion is altered and colloid is stored in the cells. Diffuse colloid goiter results. Second, exophthalmic goiter occurs, due to some unknown stimulation of the gland. In this we have an increase in the number of cells in the acini or hyperplasia. Third, adenomatous goiter, due to formation of new acini. This new growth may be encapsulated or not (adenomatosis) and clinically is recognized as nodular goiter, possessing the tendency to hyperthyroidism.

Clinically and therapeutically it is of great importance to distinguish between adenomatous and exophthalmic goiter. In hyperfunctioning adenoma we have pure hyperthyroidism, due to excessive normal thyroxin production. But in Graves' disease we have not only this but also the formation of an abnormal thyroxin, probably deficient in iodine. The abnormal thyroxin is responsible for the characteristic symptoms of Graves' disease, as differentiating it from toxic adenoma, i. e., the nervous symptoms, crises, vomiting, vasomotor disturbances (sweating), staring and exophthalmos. The abnormal thyroxin fraction may have a special affinity for those tissues, the disturbance of which is pathognomonic of exophthalmic goiter.

With sufficient iodine available abnormal thyroxin will probably not be produced. There are cases of Graves' disease with very marked nervous and ocular symptoms caused by the abnormal thyroxin and yet having a normal basic metabolism. Other cases having no nervous or ocular symptoms whatever yet show a very high metabolic rate. It was on this observation that Plummer built his hypothesis, involving the use of iodine, after seeing patients in fatal crises with low metabolism, and others in good condition with high metabolism attributable to an excessive production of normal thyroxin.

He conceives that under intense stimulation, and with a relatively deficient iodine supply, the thyroid gland cannot utilize the iodine in the blood. The results of his hypothesis in practice have been marvelous and the life-saving effects of iodine in Graves' disease are incalculable. By giving iodine he practically transforms an exophthalmic into a hyperfunctioning adenomatous goiter. The fact that administering iodine in many cases of Graves' disease causes metabolism to drop to normal suggests that the abnormal thyroxin acts to stimulate oxidation in the tissues, as does normal thyroxin, and that stopping the formation of abnormal thyroxin by iodine may at the same time diminish the secretion of normal thyroxin.

The lecture is not by any means wholly devoted to hypotheses but details of using Lugol's solution in practice are given in various phases of goiter. It has proven of no value in adenoma and may indeed cause iodine hyperthyroidism in this lesion. Plummer affirms that iodine treatment of Graves' disease has reduced the operative mortality to that of toxic adenoma and has absolutely abolished death from crisis status and infections, if given early. He also avers that the drop in operative mortality in adenoma (which has been 3.5 per cent for years) to 1 per cent at Rochester is due to stopping the use of digitalis in auricular fibrillation in these cases. We have all admired the genius and originality of Plummer but have suffered from his obscurity of language in translating his ideas into print. In this book, however, he has outdone himself and given the reader a clearer insight of his mind and its intricate speculations and hypotheses which have borne such rare fruit.

WINSLOW.

LOCAL ANESTHESIA IN OTOLARYNGOLOGY AND RHINOLOGY. By James Joseph King, A. B., M. D. Assistant Surgeon in Otology, New York Eye and Ear Infirmary, etc. Illustrated; 205 pp. $5.00. Paul B. Hoeber, Inc. New York, 1926.

Although this book is written for the rhinologist and otolaryngologist, it should be in the hands of all who are called upon to do surgery, as the modern trend of surgery is more and more toward the use of local anesthetics. The author has divided the book into two parts. Part I includes the development of local anesthesia and its technic in rhinology and otolaryngology. Here we find the history of local anesthesia, including the various agents for producing it and a comparison of their relative merits, singly and in combination. Chapter VIII is given over to the synergistic action of morphine, magnesium sulphate and novocaine. The technic of the various operations in this field is handled in a masterly way and the whole is concluded with a comprehensive bibliography.

Part II embraces the reports of the committees of the American Medical Association on the toxicity, advantages and disadvantages of the various local anesthetics in nose and throat work. This information is compiled and made accessible to the surgeon in a convenient and acceptable form. In conclusion, the reviewer will state he believes this is the best work of its kind and he cannot recommend it too highly to those who are interested in local anesthesia.

CHASE.

THE SURGICAL TREATMENT OF GOITER. By Willard Bartlett, A. B., A. M., M. D., D. Sc., F. A. C. S., St. Louis. With Foreword by Dr. Charles H. Mayo, Rochester, Minn. With 130 Original Drawings. 365 pp. $8.50. The C. V. Mosby Co., St. Louis, 1926.

Diseases of the thyroid gland have received much notice of recent years in the published works of many recognized authors. We have before us a book which deals only with those phases of the subject relative to the surgical treatment. It is unnecessary to say that it brings to us in detail information of the refinements of this treatment. The author has always been known as one who is particular about minutiae and even in his preface emphasizes the importance of acquiring a specialized operative technic, delicacy of touch and an artistic sense in order that surgery may be most successfully accomplished.

Personal experiences of the author are recited at

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length and many case reports are used to illustrate points in diagnosis, technical details, complications and aftertreatment. We commend the work highly for its thoroughness, frankness and suggestiveness to those who are working in this field.

FORBES.

PRACTICE OF PHYSIOTHERAPY. By C. M. Sampson, M. D., Formerly of the Physiotherapy Service, Walter Reed U. S. Army General Hospital, Washington, D. C., etc., with 146 Illustrations. 620 pp. $10.00 The C. V. Mosby Company, St. Louis, 1926.

This is the best book published dealing with the subject of physiotherapy. The author has had a wealth of experience, and has been a pioneer in forming this line of practice. In consequence he is an authority on every phase of physical measures which are described in this volume. He does not emphasize attention to one modality but freely devotes space to the description of all forms. The static current with its various applications is described. In discussion of the high frequency current he explains the electric principles involved, especially with their reference to diathermy. Its application to diseased conditions is presented in all its phases. Quartz ray therapy is dealt with in all forms of its application to disease. The galvanic and sinusoidal currents are described and their applications enumerated. Massage and hydrotherapy are also considered. Part II is devoted to clinical applications, in which different diseases are considered and their treatment by physiotherapy measures is described. This volume contains much more material than the preceding, and gives the latest information pertaining to all aspects of physiotherapy.

SMITH.

A MANUAL OF PROCTOLOGY. By T. Chittenden Hill, Ph. B., M. D., F. A. C. S. Instructor in Proctology, Harvard Graduate School of Medicine, etc. Second Edition. Thoroughly Revised. Illustrated with 101 Engravings. 294 pp. $3.50. Lea & Febiger. Philadelphia and New York, 1926.

This manual, which was first issued in 1923, has shown its popularity by going to its second edition this year. There is nothing so valuable to the general practitioner as a compact, concise exposition of the many different subjects he is required to cover. Hill's work is a book of this type. The author gives those lines of treatment that he has found the most useful in his long successful practice. To anyone who has not a late work on proctology this manual can be highly recommended. The most excellent article on the radical operation for cancer is by our confrere in Portland, Dr. Robert C. Coffey.

CROOKALL.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume X, Number II, (Philadelphia Number, September 1926.) Octavo of 217 Pages with 16 Illustrations. Per Clinic Year, July 1926 to May 1927, Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

There are many interesting reports in this Philadelphia number. Sailer and Lynch discuss bloodstream infection as the cause of backache, describing five cases of obscure origin until blood examination disclosed organisms, always of a streptococcus variety. Several of the cases were cured by administration of a vaccine prepared from the patient. Boles reports a case of Hodgkin's disease of the abdominal type, in whom the retroperitoneal glands were involved. Later appeared inflammation of numerous joints before the correct diagnosis was determined. Enlargement of the axillary, cervical, and inguinal glands appeared three months after an operation for the abdominal condition. Stroud reports 134 patients with auricular fibrillation observed over a period of five years. Forty-two of these were treated with quinidin sulphate, under which 27 had a successful return to sinus rhythm, indicating that this drug has a definite place in the treatment of this disease.

THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume VI, Number 3 (Chicago Clinic Number — August 1926). 324 Pages with 101 Illustrations. Per Clinic Year (February 1926 to December 1926). Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

This volume, as usual, is replete with valuable and suggestive clinical reports on a great variety of surgical conditions, presented by many well-known surgeons of Chicago. Discussions are offered of various abdominal diseases, including surgical treatment of gastric and duodenal ulcers, by several writers, pyloric obstruction, biliary disease, echinococcus cyst of the liver, hydronephrosis and other conditions. There are reports on different fractures, including those of the pelvis, tibia, fibula and Pott's. A variety of pulmonary surgical conditions are presented for the treatment of tuberculous and other conditions. This volume is well worth the consideration of any surgeon.

MENACE OF SLIGHTLY POSITIVE WASSERMANN REACTION. James Herbert Mitchell, Chicago (Journal A. M. A., Oct. 23, 1926), stresses the point that syphilophobia is a serious state of mind, and that its consequences may be more serious than those of the disease itself. The syphilophobe is indeed fortunate if he happens to be in the hands of a conscientious and well trained syphilologist who will not subject him to unnecessary treatment; but if he falls into the hands of a quack or a mercenary and unscrupulous physician, his health may be ruined and even his life destroyed. The patient having a real or imaginary venereal disease is so completely at the mercy of the clinician and the serologist that if either one or both be dishonest, the patient may become the victim of their collusion and extortion, as the Wassermann report is an ideal instrument of quackery; the blood may be drawn in one room, for the psychologic effect on the patient, and thrown into the sink in the next. Meanwhile the most impressive kind of a positive report may be typed on imposing blanks with multicolored inks and elaborate signatures. As a clinician, Mitchell considers himself not qualified to discuss the technic of the Wassermann reaction. He does not minimize the value of the test, but thinks it important to call attention to some of the unfortunate clinical results of the slightly positive reports given out to the layman and to the medical man who still has unbounded faith in the infallibility

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ORIGINAL CONTRIBUTIONS

THE DIAGNOSIS AND TREATMENT OF BRAIN TUMORS*

WALTER E. DANDY, M.D.
BALTIMORE, MD.

All lesions become more frequent as our acquaintance with them grows. If we hark back but a very few years, appendicitis was unknown, then very rare, and finally a very common ailment. The same story is true of any number of lesions. The great educator of true perspective is necropsy and operation. Brain tumors are passing through the rare stage because neither necropsy material nor operative inspections have checked mistaken diagnoses. But in a few clinics intensive studies have shown not only that brain tumors are among the most frequent tumors of the body, but during the first six decades, particularly from the second to the fifth decades, they are among the most common afflictions of the central nervous system.

The results of the long struggle in the solution of appendicitis should teach us much about the fundamental treatment of brain tumors, and prevent many of the sad chapters in its story when told in later years. Two accomplishments have transformed a prohibitive mortality in the treatment of appendicitis into one which should be practically nil: first and foremost, an early and accurate diagnosis; and, second, an early and efficient operative procedure which eradicates the cause.

In the treatment of brain tumors, the same two factors are all-important, and in addition there is the third great factor, *localization* of the tumor. Although the diagnosis and localization of appendicitis are nearly synonymous, the same is far from true in brain tumors. In fact, the localization of brain tumors has been the most difficult phase of this complex neurologic problem.

It is doubtless known to you all that tumors as large as one's fist are still compatible with life and without giving the slightest evidence of their situation. For many years it has been possible to know that a patient was afflicted with a tumor, but we have not been able to tell where it was located. With such inadequate information, it is clear that operative results must be very poor. Without accurate information, I should venture the assertion that in the hands of the very best operators, less than one-third of all explorations for brain tumors would actually disclose the tumor at first operation. In fact, so discouraging have been explorations for tumors of the brain, that, except when the location of the tumor seems clear, the palliative decompressive operation has become more or less routine. Obviously, such treatment is most unsatisfactory. There is only one way to cure a patient with a brain tumor, and that is by a complete extirpation of the growth by operation. Decompressions have been justifiable only because the location of the tumor has been unknown. If the location of the tumor is known, any treatment which delays or is palliative is no more justifiable than delay or palliation in appendicitis.

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Although the rate of growth of brain tumors is variable, a fatal outcome is almost inevitable. But we have many warnings of this impending calamity. Tumors cause headache, destroy vision, produce paralyses, convulsions, speech and mental and other disturbances, and most of these changes are progressive. The great hope for patients afflicted with brain tumors lies in the earliest possible diagnosis. To do this, it is incumbent upon us to suspect a tumor when any symptom or sign referable to the central nervous system makes its appearance. Fortunately, it is now possible by the use of cerebral pneumography, i.e., roentgenography of the brain after the injection of air into its ventricles or subaracnoid spaces, to diagnose and also to localize practically all brain tumors which cause pressure, and in the early stage of the tumor's growth. This being possible, the problem of handling brain tumors is greatly simplified.

The treatment of tumors is now reduced to a single simple formula: complete extirpation when the nature and location of the growth make this possible; and when impossible of removal, then and then only to produce the maximum decompression for palliation. Unfortunately, some brain tumors, by virtue of their infiltrating character, do not permit extirpation. In other instances, removal is precluded because of the invasion of the brain-stem, speech centers or other vital parts of the brain. There are, however, many nonencapsulated growths in silent areas of the brain which, if detected early, can be completely removed. The so-called silent areas of the brain were formerly the greatest handicaps to cerebral surgery because they prevented diagnosis or localization of the growths, owing to the absence of signs or symptoms. Formerly, it was necessary to perform palliative operations until the tumor grew beyond the confines of the silent brain and produced paralyses or other focal destructions of the contiguous brain with recognizable functions. Now these silent areas are the greatest assets for the success of brain surgery, for, the localization now being possible in another way, extirpation of the growth can be done with contiguous silent areas of the brain, when necessary, and still leave the patient without noticeable defects.

I have said that practically all brain tumors should now be localized and at once. Brain tumors give rise to two types of signs and symptoms: (1) localizing symptoms and (2) general pressure symptoms. If the former are present, the localization is automatically made. Their consideration need not detain us. But the overwhelming proportion of brain tumors give rise to so-called pressure symptoms, and it is to the consideration of this difficult problem of localization that I wish particularly to call your attention. As you know, the craniovertebral chamber is a closed and fixed space and its contents—blood, cerebrospinal fluid, and brain tissue—are almost totally incompressible. For this reason, a new growth is tolerated only by a compromise with these intracranial contents, and this compromise gives the warning signs: headache, nausea and vomiting, choked disc, etc.

Probably all brain tumors which produce intracranial pressure produce (as an expression of this compromise) changes in the size, shape or position of the ventricles and subarachnoid spaces of the brain. If the fluid from these spaces is removed and air is substituted in its place, these changes in size, shape and position will be accurately registered in roentgenograms of the head. It is, therefore, clear that if these alterations are known, the location of the cause which produces them (the tumor) can be deduced. I will now show you a series of lantern slides which will explain the localizations of brain tumors from every part of the brain. In many instances the localizations have been so precise as to permit transcortical incisions of great depth to find the tumor at operation, and often successfully to remove tumors which otherwise could never be found except at necropsy.

I should not wish to leave you with the impression that it is a simple and harmless procedure. Unfortunately, it is the reverse. It is both complicated and dangerous. The interpretation of the air shadows is difficult and is all dependent on the intimate knowledge of intracranial anatomy and physiology. Its danger is shown by the fact that I have had three deaths in my first 100 injections. However, in over 400 since then, there has been none. This is owing to the fact that I have learned how to eliminate the dangers. Air is an irritant. When the ventricular channels are blocked, its absorption is prevented; a serosanguinous exudate results from its irritation, and this produces a marked accentuation of pressure symptoms. Many patients are so ill that this additional pressure could not be tolerated. To prevent this complication, the air should be removed as soon as possible after the skiagrams are completed. If the quantity of air injected is large (30 c.c. or more), either the original ventricular fluid or saline solution may be replaced. In safe hands the procedure is now without great danger. It seems inadvisable, at least at the present time, that a risk so great as the use of air requires should be assumed except by a competent neurologic surgeon.

Lantern slides were then shown as follows:

1. *Tumors of the Frontal Lobe.* The localizations were made by dislocation of both lateral ventricles and the third ventricle away from the tumor (anteroposterior view). Often the homolateral ventricle, and at times also the third ventricle, were obliterated. The third ventricle, when present, takes an oblique instead of a normally, upright position (anteroposterior view); ventricular filling defects on the side of the tumor (lateral views).

2. *Tumors of the Temporal and Parietal Lobes.* Practically the same pictures as frontal lobe tumors, though with more pronounced filling defects. There may be elevation of the descending horn of the ventricle in temporal lobe tumors. Parietal tumors may dislocate the body of the ventricle downward, broaden its diameter and shorten its height, or narrow its diameter and increase its height, depending on the exact position of the tumor.

3. *Tumors of the Occipital Lobe.* The lateral dislocation of the anterior horns of the ventricle (anteroposterior view, occiput down) is less than in frontal, temporal and parietal tumors, and may even be absent. Filling defects of ventricles and alterations in size, position and shape of the ventricles.

4. *Ventricular Tumors.* Filling defects in ventricles and evidences of hydrocephalus from closure of the ventricles. A small tumor in the body of the lateral ventricle showed a normal ventricle anterior to the tumor and hydrocephalus of the ventricle posterior to it. The sharp anterior and posterior margins of the tumor were shown by the abrupt lines of termination of the air shadow. A tumor of the third ventricle showed a bilaterally symmetrical hydrocephalus, but with no communication between the two lateral ventricles and with absence of the third ventricle.

5. *Tumors Producing Symmetrical Dilatation of the Lateral Ventricles with Intercommunication.* This line of tumors included (1) suprapituitary tumors growing upward and occluding the aqueduct of Sylvius, (2) pineal tumors, (3) tumors contiguous to the pineal and the third ventricle, (4) tumors in various parts of the posterior cranial fossa (cerebelum, cerebellopontine angle, brain-stem and fourth ventricle). All of these tumors block the iter or fourth ventricle. In one instance a shadow of a suprapituitary tumor was seen in the air background of the dilated ventricles; its presence could not be detected except in the presence of air. This has been an important finding in many other tumors situated elsewhere. In another case of suprapituitary tumor, the tumor had grown lateralwards and blocked one lateral ventricle and partially obliterated the third ventricle.

A pineal tumor was shown causing dilatation of the ventricles with partial obliteration of the third ventricle, and a large shadow of calcification in the air background.

An endothelioma arising from the leptomeninges near the pineal produced a great hydrocephalus of both lateral ventricles, partial obliteration of the third ventricle, and a great filling defect of the left lateral ventricle.

Various tumors of the posterior cranial fossa produce dilatation of the third and both lateral ventricles. A case of cicatricial closure of the foramen of Magendie was shown (with dilated lateral and third and fourth ventricles). After a new foramen of Magendie had been constructed, the air could be seen in the cisterna magna and the cerebral sulci (indicating that the new foramen was patent several weeks after the operation). The patient has since remained well (now four years). Another case was shown in which a tremendously dilated cisterna interpenduncularis extended upward and produced a great filling defect in the left lateral ventricle. Both lateral ventricles were of enormous size, owing to the obstruction in the cisterna.

SYPHILIS OF CERVIX. George Gellhorn, St. Louis (Journal A. M. A., Nov. 27, 1926), is of the opinion that syphilis of the cervix occurs far more frequently than is generally assumed, and that it may exhibit manifestations in any of the three stages of the disease. Primary and secondary lesions, while sufficently characteristic, are apt to be overlooked, because they produce no symptoms. On the other hand, tertiary lesions which appear in the form of gummas or gummous ulcers give rise to bleeding and discharge, and resemble carcinoma to such an extent that many patients have erroneously been subjected to unnecessary and dangerous operations. In contradistinction to the usual protracted course of the disease, was the observation of "galloping" syphilis of the cervix in which the infection ran its entire course from the initial lesion to a fatal ending in less than a year. A number of interesting and important problems are intimately connected with the subject of syphilis of the cervix. These are: (a) the infectiousness of cervical secretions in syphilitic patients; (b) the possibility of dystocia from rigidity of the cervix caused by syphilitic lesions and (c) the transition of syphilis into cancer of the cervix.

THE DIAGNOSIS OF INTRACRANIAL SUPPURATION *

Harry L. Parker, M.B.
ROCHESTER, MINN.
Section on Neurology, Mayo Clinic

HISTORICAL

The ancients recognized the grievous nature of intracranial suppuration and knew that patients afflicted with it died speedily. In writing on injuries of the head, Hippocrates says, "When suppuration is fairly established in it (the wound), small blisters form on the tongue and he dies delirious and for the most part convulsions seize on the other side of the body: for, if the wound be situated on the left side, the convulsions will seize the right side of the body and some become apoplectic and thus they die before the end of seven days, if in summer, and before fourteen, if in winter." He advised trephining the bone down to the dura. In his "Prognostics" he makes this allusion to otitis media and presumably meningitis, "Acute pain of the ear with continual and strong fever is to be dreaded: for there is danger that the man may become delirious and die." Alexander of Tralles likewise noted that inflammation within the ear sometimes spread to the brain and proved fatal. Paulus Aegineta spoke of a disease known to Hippocrates, Galen, Aretaeus, Alexander, and Aetius as phrenitis and described it as "an inflammation of the membranes, the brain also being sometimes inflamed along with them." He describes its symptoms thus: "Cases of true phrenitis are for the most part attended with watchfulness, but sometimes with disturbed sleep, so that the patients start, leap up and cry out furiously. They forget what is said and done by them, their eyes are blood-shot and they rub them. The tongue is rough and there is a trickling of blood from the nose, they pick at flecks of wool and gather bits of straw and have acute fever during the whole continuance of the disorder. The respiration is large and rare when the brain is primarily affected." From an old Persian manuscript comes a story of Aristotle. An earwige was supposed to have entered a patient's ear and attached itself to the brain. Aristotle gave the patient a drug to make him unconscious and an Indian surgeon named Sarnab trephined the skull.

Fabricius Hildanus (1560-1634) relates cases of brain abscess and fracture of the skull, and clearly recommends trephining for retained pus and blood, even when the skull has not been fractured. A fatal case of suppurative otitis seen in 1599 is described very fully by him. Mr. Secretary Pepys wrote in his diary of February 3, 1677, of the operation on Prince Rupert who had been shot in the head at Armentieres in July, 1649, and as a result apparently suffered from chronic osteomyelitis of the skull, "Having cut the outward table as they call it, they found the inner all corrupted so as it came out without any force; and their fear is, that the whole inside of the head is corrupted like that." His fears, however, were groundless, for the royal patient recovered and lived for some years after.

Morgagni (1682-1771) refuted the erroneous theory of Valsalva that abscess of the brain was a primary disease and suppuration of the ear secondary to it. He says: "Abscess of the brain results from suppression of discharge of the ear." He relates cases in which carious erosions had opened a passage between the ear and the cranial cavity. His book, "Seats and Causes of Disease," contains many minute observations, both clinical and postmortem, on suppuration in the brain and meninges.

The succeeding generation of surgeons learned to recognize cerebral abscess and the possibilities of its cure by the use of the trephine. At first they were too timorous to incise the brain. Petit (1674-1750) described the case of a patient trephined by him. He cut the dura but let the abscess rupture spontaneously through the brain substance. A few years later, Dupuytren (1775-1835) advocated the courageous plunging of a knife into the abscess and claims that, "By this bold proceeding patients have been saved." Baron Larrey (1766-1842), the French surgeon of the Napoleonic wars, was sufficiently diverted from his study of broken heads to describe a fatal case of otitic cerebellar abscess.

In Cruveilhier's Atlas there is a beautiful illustration of an abscess of a temporal lobe. A similar drawing, showing the abscess and the diseased temporal bone, was published by Richard Bright in 1831.

The commencement of the present era was by Macewen, whose book, "Pyogenic Infectious Diseases of the Brain and Cord" (1893), still remains a classic. In 1881, he was opening abscesses of temporal lobes and draining them with a success quite equal to that of most modern surgeons.

GENERAL CONSIDERATIONS

Even with our modern methods of diagnosis, intracranial suppuration still remains a vexatious

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problem and one greatly feared by all. The contents of the cranium can be neither seen nor felt by ordinary means. Disease inside the skull must be inferred, if they are not made directly visible by surgical exploration. In the majority of cases there are only a series of clinical symptoms and indirect signs for guides as well as the past experience with such diseases. The organs involved are complex and vital, and correspondingly intricate, and mortal diseases result from their insult. Inflammation inside the cranium differs from that elsewhere, in that the swelling of the inflamed parts is limited by the rigid bony case around them. A high degree of tension occurs, affecting all parts by pressure. The skull, however, is a strong barrier against trauma, and moreover it is lined by the tough fibrous dura mater that is highly resistant to the entry of infection into the more delicate structures inside. Once past the skull and dura, microörganisms have an easier path. The cerebrospinal fluid circulates freely throughout the central nervous system. It has poor bactericidal powers but serves rather as a fair pabulum for the growth of microörganisms. Accordingly, infections once inside the dural envelope may spread rapidly and diffusely over the surface of the brain and cord. The pia-arachnoid limits infection somewhat by walling off local areas of relatively mild inflammation, but its power is feeble compared with that of other membranes in the body. The brain is poor in mesodermal tissue and, therefore, cannot form a very strong fibrous zone around infection planted in its substance. The encapsulation of an abscess is slow, inefficient, and easily broken down. On the whole, suppurative disease inside the cranial cavity is infinitely more deadly than elsewhere in the body, not only because of the vital structures involved, but also because of the poverty of its resistive mechanism.

DISEASES OF THE MENINGES

The dura mater, representing, as it does, a bulwark against the invasion of the cranial cavity by suppurative disease, is seldom involved in its entirety; more usually it is affected locally by some contiguous area of bony suppuration. Osteomyelitis of the skull, suppurative otitis and mastoiditis may spread inside and affect the dura. In that case it becomes thickened, softened, and hypervascular. Granulations appear on its affected surface, and it may be stripped from the bone over a small, sharply localized area by an accumulation of pus, or an extradural abscess which may simulate a brain abscess, except that the symptoms of cerebral pressure are less marked and focal symptoms are much more often absent.

Acute, purulent, cerebrospinal leptomeningitis has, as a rule, a diffuse distribution. Although in certain cases it may be more marked at the base of the brain than at the vertex, it is seldom entirely limited to either site. When acute meningitis is once fully established in the loose arachnoid meshwork, it tends to spread rapidly and widely until the whole cerebrospinal meningeal surface is involved as well as the ventricular ependyma. In most instances the cerebral cortex is involved to a varying depth, and the meningeal sheaths of the cranial and spinal nerves are also affected. The membranes first become hyperemic and lose their luster. Later a greenish-yellow exudate is formed that fills the sulci and becomes plastered over the surface of the brain and cord. The ventricular fluid is purulent and with the sealing of the natural channels of circulation of the cerebrospinal fluid a certain degree of hydrocephalus may develop. The cerebral cortex becomes soft and hyperemic. The cranial nerves become smothered in the purulent exudate and the subarachnoid space in the cord may become obliterated.

Suppurative leptomeningitis may be (1) part of an acute epidemic or sporadic disease due to the meningococcus, in which the meningitis is the outstanding feature; (2) it may result from a local cranial suppurative process, such as suppurative otitis media, osteomyelitis of the skull, orbital suppuration, and infections of the nasal cavity and accessory sinuses; (3) it may be part of a general infection with pyemia; (4) it occasionally occurs as a complication of acute infectious disease, such as pneumonia, typhoid fever and smallpox. Perhaps the more frequent causes are the cranial suppurative processes, especially acute or chronic suppurative otitis media. The temporal bone becomes diseased and the microörganisms gain entry to the meninges through the tegmen tympani, the wall of the mastoid antrum, along the seventh and eighth cranial nerves, or through some of the natural channels leading from the internal ear to the cranial cavity. Infection of the large venous sinuses from thrombosis of the veins leading to them not infrequently is the connecting link between meningitis and otitis suppuration.

The clinical picture of acute, spreading, purulent, leptomeningitis is striking and enough to inform one that the unfortunate sufferer is indeed seriously ill. The first impression is of a darkened room and a restless, delirious, groaning patient lying on his side, huddled under the bed clothes. Complaint is made bitterly and continuously of a headache that may persist through deep stupor, when all of the sensations are dulled by toxemia. Any attempt at examination is firmly resisted. The head is drawn back with the neck rigid, and severe exacerbations of pain and out-cry are induced by an effort on the part of the examiner to flex it. The patient's knees are drawn up and extension of the leg on the flexed thigh is impossible because of the tension of the hamstrings (Kernig's sign). The patient repeatedly carries his hand to his head and picks his nose until it bleeds. At the onset he may be rational, but after wild, noisy delirium he gradually quiets into a dull stupor. The face is flushed and the eyes sparkling at first, later the color becomes an ashen gray and the face expressionless except for occasional grimaces due to the crises of headache. A high fever is the rule, and the pulse is rapid and feeble. Constipation and retention of urine change towards the end to complete incontinence. Paralysis of the muscles of the eye is common, with strabismus, ptosis, and disturbance of the pupillary reflexes. There is intense photophobia so that on any attempt to examine the eyes the lids are screwed up and have to be opened forcibly. Twitchings and paralysis of the facial muscles occur and when the cerebral cortex becomes involved general convulsions, jerking of the limbs, and stupor appear. Then coma ensues and finally death.

The course of the disease is short, seldom more than two weeks, and in fulminating cases exitus may occur within forty-eight hours. The diagnosis is not difficult clinically, but examination of the spinal fluid is always advisable, and especially early, to determine the nature of the organism. Usually the fluid is under pressure, is cloudy, turbid or yellow with pus, and contains a large number of pus cells. The common organisms found are the meningococcus, pneumococcus, streptococcus and staphylococcus. Less frequently the colon bacillus, pneumobacillus, and bacillus of typhoid fever are seen. Wide differences in prognosis lie between the meningitis due to the meningococcus and that due to the pneumococcus. In the former a specific serum can be used and the patient helped considerably toward recovery; in the latter the outlook is almost certain death, no matter what is done.

In certain diseases, particularly suppurative otitis, no organism is revealed even by the most patient search. The fluid on culture proves sterile, even though it is as cloudy as in any case of meningitis, and the patient clinically has a definite meningeal involvement. Patients may recover, and it is possible that the process is local and that no diffuse spread has occurred. Alarming symptoms suggesting meningitis may occur in children with acute suppurative otitis media, yet without actual meningeal invasion, as shown by the normal cerebrospinal fluid. The same phenomenon may occur in cases of pneumonia, typhoid fever and influenza, and for this the name, "meningism," has been coined. The headache, delirium and restlessness with perhaps slight rigidity of the neck in these diseases is frequently due to the general toxemia and cerebral involvement, for at necropsy no signs of meningeal inflammation may be evident. Syphilitic meningitis may run an acute course with fever, stupor, and muscular rigidity and twitching. The Wassermann reactions of the blood and spinal fluid will differentiate this disease. Tuberculous meningitis is more insidious in its onset, and the spinal fluid shows an excess of lymphocytes over polymorphonuclear cells and contains the bacillus of tuberculosis. Tuberculous foci may be present in various organs of the body, especially the lungs and genitourinary system.

Purulent leptomeningitis of mycoctic origin may be due to various fungi, more commonly actinomyces, blastomyces, various types of yeasts, and aspergillus. The source of disease may be obvious as in actinomycosis, when there is a large, indurated swelling in the neck and jaw. The fungus penetrates the base of the skull by direct extension and affects the meninges at the base. The course is very slow, and may be spread over weeks and months with relatively little constitutional reaction to the meningeal invasion. The cranial nerves at the base may be attacked and the spinal fluid be thick with pus cells, yet the patient will feel well enough to be up and around. The characteristic yellow granules of the fungus, consisting of a core of mycelium and a cortex of spores, may be found in the spinal fluid or extracted from the tissues of the jaw. The other fungi may gain entry to the meninges through the accessory sinuses of the nose, following an acute respiratory infection. The disease progresses slowly over a period of months and involves the base of the brain. At first there is some pain in the area of the fifth nerve, ocular palsy, ptosis, and paralysis of the seventh nerve. There is marked loss of weight, but no fever or leukocytosis. Towards the end secondary infections occur and fever appears. The patient may then show all the signs of acute meningitis and die within a few days. The fungus or its spores may be found in the spinal fluid. At postmortem there is usually found an enormous thickening of the meninges at the base and around the spinal cord, with a thick, greenish, purulent exudate. Apart from actinomycosis the various types of mycotic leptomeningitis are so rare that they are seldom thought of and therefore missed.

Case 1. Acute purulent leptomeningitis. A boy, aged eleven, was brought to the Mayo Clinic January 18, 1926. Three weeks before he had had acute coryza with earache and a spontaneous rupture of the left tympanic membrane with purulent discharge. Two weeks before, severe headaches had appeared and his local physician diagnosed pansinusitis. The discharge from his ear had ceased twenty-four hours before but the headaches had increased considerably, with prostration and restlessness. He was found to be acutely ill, delirious, restless and irritable. He was constantly picking the bed clothes and his nostrils which were bleeding. His temperature was 104° and his pulse rate 130. On bending the head forward there was a marked rigidity of the neck and considerable outcry because of the pain induced. Kernig's sign was present and there was intense general muscular irritability. The left ear drum was thickened and red but healing, and the discharge had completely ceased. His spinal fluid was turbid, under pressure, and contained countless pus cells. Pneumococci could be readily demonstrated in a direct smear made from the spinal fluid. The course of his disease was short. He became rapidly worse and towards the end was stuporous. Death occurred thirty-two hours after admission. Necropsy revealed left purulent otitis media, early septic thrombosis of the cavernous and petrosal sinuses, and diffuse leptomeningitis.

DISEASES OF THE SINUSES

Inflammatory thrombosis of the venous sinuses of the cranial cavity is seldom a pure and uncomplicated disease; rather it appears during the course of a series of morbid processes. Usually the sinus is infected from a suppurative process in an adjoining bony structure, either by direct extension or through the emissary veins. Common causes are suppurative otitis media with or without mastoiditis, osteomyelitis of the skull, orbital cellulitis or abscess, furunculosis, erysipelas and cellulitis of face and scalp. The membranous walls of the sinus become softened, thickened and hyperemic. Thrombosis occurs in the lumen and spreads for a variable distance each way. The clot may become purulent, in which case the wall gives way and an abscess forms around it. Usually there is an associated local meningitis and possibly an extradural abscess, especially if the transverse sinus is affected. Even if a thrombus plugs the lumen of the sinus, infected clots may enter the general circulation and give pyemic symptoms with the distribution of infected infarcts throughout the body. The clinical syndrome is seldom pure, but is complicated by one or more causal and associated diseases. For example, suppurative otitis media, mastoiditis, extradural abscess and thrombosis of the transverse sinus may all exist together at one and the same time. There are certain signs, however, that are suggestive of sinus involvement: (1) those due to the influence on the general system by the thrombophlebitic process, and (2) those due to the particular sinus involved.

The general signs are those commonly associated with suppurative thrombophlebitis anywhere in the body. Essentially they are those of pyemia. The onset is sudden and marked by rigor, septic temperature and sweats. The chills are repeated with each rise in temperature, sometimes until the disease becomes arrested, spontaneously, by surgical intervention or by death. The temperature may rise abruptly to 104° or more, then fall below normal within twenty-four hours. Usually it oscillates between 103° and 99°. Diarrhea, rapid pulse, foul breath, enlargement of the spleen and pain in the chest from septic emboli with infarction are common manifestations during a severe process, and suppuration of joints or endocarditis may appear during a prolonged course. Cultures of the blood when positive indicate bacteremia. The patients are bright and alert in contrast to the delirium of meningitis and the apathy of brain abscess. According to the particular sinus involved, there are some individual peculiarities. It is possible, however, for two or even three venous channels to be affected simultaneously.

The transverse sinus, on account of its propinquity to the middle ear, mastoid antrum and air cells, is of all the sinuses the most frequently diseased. In acute cases infection may reach it through the small veins draining from the mastoid and middle ear into the petrosal and transverse sinuses. More usually it is affected during the course of chronic otitis media by erosion of the bony partition, and frequently an extradural abscess is found around the sinus before it finally is attacked. Apart from the general signs of thrombophlebitis with pyemia as mentioned before, there are few specific signs indicating thrombosis of the transverse sinus except the fact that the general signs occur during an acute or chronic infection of the ear. Edema over the mastoid, pain in the upper part of the posterior triangle of the neck, enlargement of the cervical lymph nodes, and pain on turning the head have all been given as signs, but may also occur in uncomplicated infection of the mastoid. Somewhat more reliable, but not always present, are the signs of extension of the thrombosis to the upper third of the internal jugular vein. This vessel becomes tender and can be felt as a round hard cord. Apart from this evidence of venous obstruction, the combination of acute or chronic otitis media with the general signs of septic thrombophlebitis is sufficient strongly to suggest thrombosis of the transverse sinus.

Thrombosis of the cavernous sinus is somewhat different in that there are certain outward signs that suggest its presence, chiefly those of venous obstruction. Infection reaches this sinus through the superior ophthalmic vein and the jugular vein from the front, through the petrosal sinuses from the rear, or through the pterygoid plexus from below. Accordingly, the sources of infection may be an orbital cellulitis or abscess, furunculosis or erysipelas of the face; infections in the middle ear; or inflammation of the tonsil, pharynx or deep tissues of the neck.

The signs and symptoms are due to two factors: venous obstruction and pressure on the nerves in and around the cavernous sinus. The first produces edema of the eyelids and root of the nose, chemosis and protosis of the globe of the eye. The eyelids are dusky and have engorged venules on their surface. There may be papilloedema of the optic nerve head. The second factor produces blindness, ocular paralysis, and some pain over the first divisional area of the fifth nerve. Ptosis is present, but obscured by the bulging of the eye and swollen eyelids. The pupil does not react to light or accommodation, and, although myosis is generally present at the onset, a wide, fixed pupil is the final result. Complete ophthalmoplegia may result, but usually the picture is one of weakness of the muscles supplied by the third, fourth and sixth cranial nerves unevenly distributed. At the onset the condition is unilateral, within twenty-four hours the other side also may be involved, and characteristically the eye first affected improves. According to Macewen, this alternate involvement of both eyes is pathognomonic and distinguishes the condition from orbital suppuration which is usually unilateral. As well as these local signs there is the usual general symptom of a septic thrombophlebitic process. Often basilar meningitis develops at some stage of the disease. The complete clinical picture of the disease is represented by a patient very ill with fever and sepsis, and with bulging, squinting eyes, almost obscured by huge, swollen, dusky eyelids. It is one not easily forgotten.

Thrombosis of the longitudinal sinus as a rule is only part of a septic process, including injury or infection of the skull or sinuses, purulent leptomeningitis and pyemia. Edema of the scalp and forehead is sometimes seen but tends to be obscured by the causal disease in the bone. Epistaxis is said to occur, and a rare symptom is jacksonian convulsions of both lower extremities, due to irritation of the leg center in each cerebral hemisphere. General convulsions with resïdual hemiplegia are much more common. Actually, there is nothing pathognomonic in any of the signs and no way of clearly differentiating the process from the other morbid manifestations with which it is usually associated.

Case 2. Cavernous-sinus thrombosis, originating from a furuncle on the nose. A man, aged twenty-three was brought to the Mayo Clinic November 29, 1924, because of headaches and delirium. Twelve days before, he had developed a furuncle on the tip of his nose. Within four days he experienced a severe headache and his eyelids became swollen. Chills and fever developed and he complained of double vision during the week preceding his coming here. He was found to be acutely ill, pale, toxic and delirious. His temperature was 104° and his pulse rate 120. There were remains of his original nasal furuncle. His eyelids were swollen with enlarged venules on the surface and his eyes protruded. There was a bilateral internal strabismus and ptosis and the retinal veins were engorged. His neck was rigid and Kernig's sign was present. His spinal fluid contained 900 leukocytes for each cubic millimeter. The blood culture made on several occasions showed staphylococcus.

He became progressively worse, developing one complication after another, but lingered for two months. He developed in turn epididymitis, metastatic pneumonia, polyarticular arthritis, bilateral otitis media and endocarditis. His cranial nerves became paralyzed one by one until there was a complete bulbar paralysis. Death resulted from toxemia and exhaustion.

DISEASES OF THE BRAIN

Purulent encephalitis or brain abscess is an accumulation of pus in the brain produced by microorganisms. It represents one of the most difficult of diseases of the central nervous system to diagnose and localize correctly. The problem of diagnosis becomes an even greater responsibility and anxiety because of the issues involved in the disease, depending on the diagnosis. With our recently acquired skill in otologic and neurologic surgery a brain abscess once recognized can be attacked surgically and a very happy result may ensue. A mistaken diagnosis or unsuspected abscess usually means death sooner or later. With such wide difference in prognosis it is no wonder that anxiety is felt, and the burden of responsibility is in no way lightened by the innumerable complicating factors that may appear in the individual case.

Cerebral abscesses have their origin in three sources: trauma, direct infection from suppurative foci in the immediate neighborhood of the brain, or metastasis from more distant parts of the body.

Trauma wherein the scalp is cut, the skull broken and possibly bone splinters or foreign bodies are driven into the brain, is a very common cause of brain abscess. Infection along this track may heal on the outside, leaving a focus of suppuration in the brain to declare itself at some later date in the form of an abscess. This may give rise to symptoms soon after the injury, or there may be an interval of apparent health of some weeks, months, or even years before signs of a brain abscess appear. The trauma may have been slight and forgotten. More often, however, there is an initial reaction from the trauma and sufficient signs of meningitis or encephalitis to suggest an intracranial infection from the beginning.

Neighborhood foci of suppuration in the tympanic cavity, mastoid antrum or accessory sinuses of the nose are a still more frequent source of brain abscess than trauma. Chronic purulent otitis media, with or without mastoiditis, is the direct precursor of brain abscess in at least half of all cases. At some time or other a chronic infection of the ear flares up and the osseous and membranous barrier between the ear and brain gives way.

The pathways of infections are numerous, but the most common one is that leading through the thin plate forming the roof of the tympanic cavity, the tegmen tympani. The process is not always abrupt for often several stages must be passed through before the brain finally becomes affected. When free drainage of pus from the ear is obstructed, the tegmen becomes discolored and eroded, and may even become necrosed. The dura mater, a strong barrier against intracranial infection, attempts to hold back the invasion by the formation of granulation tissue and, although stripped from the bone in a small area, it temporizes and an extradural abscess forms. If this is surgically drained, the invasive process may stop then and there, or it may extend further to the pia-arachnoid, which in its turn becomes thickened and adheres to the dura and surface of the brain. A conical projection of the thickened membranous exudate and granulation tissue is thus formed, and it indents the under surface of the temporal lobe of the brain. By now the pial blood vessels are involved in the inflammatory process. They become thrombosed and infection passes it along their perivascular lymphatic sheaths or along the thrombosed contents of their lumen deep into the area of cerebral white matter which they supply. Thus the infection reaches the white matter below the cortex so there may be a macroscopically normal layer of brain tissue between the abscess and the inflamed meninges. At first an ill-defined area of encephalitis is produced. This becomes purulent, breaks down and ultimately results in an abscess with or without a limiting capsule. In acute cases the infection may pass from the ear and meninges into the brain by direct extension so that a definite abscess track leads from the ear into the brain.

Erosion of the roof of the tympanic cavity by this process tends to produce an abscess in the overlying temporal lobe of the brain. The cerebellum is usually reached either through the inner wall of the mastoid antrum or through the labyrinth. In the former case the site of erosion of the bone is frequently in the neighborhood of the transverse sinus. An extradural abscess is likely to be formed around the sinus and it may become thrombosed. Sinus thrombosis is, in fact, a common complication of cerebellar abscess, especially in acute cases. The sinus may escape involvement, however, and the labyrinth be destroyed by suppuration and necrosis, thus opening a pathway to the cerebellum. Or the path may pass along the seventh and eighth nerves, or through the vestibular aqueduct, but infection passing along natural channels in the bone into the cranial cavity is more likely to give rise to diffuse meningitis than to brain abscess.

Metastatic abscesses, or those of embolic origin, commonly arise from suppurative infections of the lung, especially bronchiectasis, gangrene and pulmonary abscess. Empyema of the pleural cavity can also be a source of infection as well as any pyemic process, like ulcerative endocarditis, puerperal sepsis and osteomyelitis. They are usually multiple.

Abscesses in the temporal lobe generally occupy the posterior inferior segment (third temporal convolution and fusiform gyrus). In the cerebellum the anterior external segment of the hemisphere is the one usually affected. Traumatic abscesses are situated at the site of the injury. Commonly they are in the frontal and parietal lobes. Rhinogenous abscesses occupy the frontal lobes exclusively. Metastatic foci occupy the areas of the brain supplied by the arteries of the sylvian fissure, especially on the left side.

The signs and symptoms of brain abscess are varied and inconstant because of the complications that arise during the course of an abscess. It is difficult to give a description that will cover all types of abscesses, but there are at least a few factors that are common to all. Traumatic and otogenic abscesses have many points in common. The metastatic variety stands in a class by itself. Briefly, the symptoms will vary according to (1) the causal disease, (2) the stage of the suppurative cerebral process, and (3) its situation.

As far as the first variant is concerned, although the original symptoms of an infection from an injury to the skull will be very different from those of suppurative otitis media or frontal sinusitis, once the infection reaches the meninges and brain rather similar reactive manifestations are produced. The symptoms and signs during the different stages of the infection inside the skull are, therefore, of more interest and more to the point in this discussion. The specific localizing signs, according to the part of the brain affected, play a part that will be discussed later.

The clinical course of a brain abscess has been divided into four stages: (1) the initial stage, (2) the latent stage, (3) that of manifest disease, and (4) the terminal stage. These stages may blend one into the other, and especially in otitic abscess the initial or latent stage may be absent or unnoticed for the symptoms may not be distinguishable from those of the causal ear disease.

As a rule, however, the initial stage represents the process of extension of the suppuration through th skull and meninges into the brain. In suppurative otitis media, whether acute or chronic, the usual earache becomes intensified, and at the onset, although the pain is confined to the ear, it soon extends into the temporal area or occiput. The pain rapidly becomes an intolerable agony, coming in crises of short duration any time day or night, but chiefly early in the morning. At the onset there may be rigor, vomiting, fever of 102° or more and rapid pulse. There may be rigidity of the neck, hyperesthesia, irritability, photophobia and muscular rigidity, indicating an advancing meningitis. Occasionally there are convulsions, unilateral monoplegia or hemiplegia, transitory aphasia, representing the initial involvement of the brain, or local encephalitis. At this stage examination of the spinal fluid will show a high polymorphonuclear leukocyte count, and often it is uncertain whether the process will go on to diffuse leptomeningitis and death before an abscess has time to form. In cases of cerebellar abscess there may be all the signs of thrombosis of a sinus with rigor, intermittent pyrexia and sweating. Frequently at this time surgical treatment is given the diseased ear and the local process thoroughly drained, or there may be no indications for surgical treatment. In either case the patient may take a turn for the better. The fever may disappear, the headache improve, and the other symptoms subside. Hopes of recovery may be entertained, but although the patient improves remarkably, for some reason he fails to return to normal.

The latent period is reached when, without much complaint, the patient fails to gain strength. There are occasional headaches, but days or weeks may slip by without much change either way. The third stage, that of manifest disease, may be ushered in abruptly by convulsions and paralysis, or recurrence of the original headache. Often, however, it approaches insidiously with signs of mental dulness. There is an increasing drowsiness, cerebration becomes slowed and the patient becomes listless, apathetic and inert. The facies is often expressionless, passive and cloudy. The pulse rate becomes slow, falling to 40 during the crises of headache, and the respirations are equally reduced in frequency. The temperature remains normal or subnormal. Spinal puncture reveals a fluid under pressure with little or no increase in the cell count. Examination of the fundus of the eye may show papilloedema of from 1 to 5 diopters, or there may be no abnormality of the nerve head. The color of the patient's face often indicates that a suppurative process still exists. It is ashy gray or has a pallor which with the drowsy dull expression is characteristic. The terminal stage then follows, if nothing is done for the sufferer. The mental dulness rapidly advances to stupor, and when the increasing intracranial pressure paralyzes the respiratory center, breathing ceases and death ensues.

Leakage and rupture of the abscess on the surface of the brain changes the clinical picture from one of increased intracranial pressure to that of a rapidly fatal diffuse leptomeningitis. The most tragic and sudden termination of events, however, is brought about by rupture of the abscess into the ventricles. The symptoms are sudden and alarming. General convulsions, opisthotonic spasms, delirium and rigor with high fever, rapidly appear. The pulse which has been slow becomes rapid, and irregular breathing is hurried or of the Cheyne-Stokes type and the pupils are widely dilated. Death in this emergency occurs within a few hours.

There are some deviations from this fairly representative picture of the course of events. Traumatic brain abscesses may have a lengthy, latent period of months or even years, during which the patient may seem well and be up and about his business. Otitic abscesses, on the other hand, may have no latent period at all, but may pass rapidly from the initial phase into the stage of manifest abscess. The signs of ear disease, of extradural abscess or of localized leptomeningitis may completely obscure the onset of the brain abscess, and, especially in cerebellar cases, the signs of thrombosis of the transverse sinus may dominate the clinical picture. Again, the initial stage may simulate a fully formed brain abscess, when as yet there is only a localized and purulent encephalitis. Surgical exploration of the cranium at that time may show only an area of hyperemic, moist, boggy brain without any free pus. The easiest cases to recognize are those in which there has been a long latent period, the suppurative focus in the skull has become quiescent and the symptoms are purely those of an expanding body in the cranial cavity plus a certain degree of sepsis.

Abscess in the left temporal lobe gives a characteristic group of symptoms. These are: (1) aphasia or word deafness (the patient cannot name objects or uses the wrong name), (2) defects in the visual field, such as quadratic (chiefly upper) or complete, homonymous hemianopsia, (3) slight weakness in the lower part of the right side of the face, especially on emotional movement; weakness and clumsiness of the right arm (seldom complete hemiplegia), (4) increased tendon and lost abdominal reflexes with Babinski's sign, all on the right side, and (5) percussion tenderness over the squamous part of the left temporal lobe. Abscesses of the right temporal lobe produce the same signs without the aphasia. Cerebellar abscesses are generally difficult to recognize and the patient may die without any specific signs being manifest, or the symptoms may be obscured by a coexisting extradural abscess or thrombosis of a sinus and the patient be so desperately ill that adequate examination is not possible. Cerebellar abscesses also are often preceded by labyrynthitis, and the vertigo, nausea, vomiting and nystagmus of the latter disease may suggest cerebellar involvement even before it occurs. Actually, cerebellar abscess is suggested by a persistent, severe headache, not usually present in simple, uncomplicated ear disease. Nystagmus in labyrynthitis tends to pass off as the infection quiets down, but persists in abscess, and unilateral ataxia on the side involved is clearly a sign of cerebellar disease. Vomiting occurs early in cerebellar abscess, and choked disc is more frequent and pronounced than in abscess of the temporal lobe. The cerebellum is near the cardiac and respiratory centers in the medulla, consequently fluctuation in pulse and respirations suggests a lesion in the posterior fossa. Abscesses of the frontal lobe arising from trauma of the skull and frontal sinusitis are suggested by the location of the suppurative focus and by the profound mental dulness, slow cerebration and apathy of the patient. A peculiar, jocular, indifferent and childish personality is characteristic. When metastatic abscess is multiple, as is often the case, it produces all the symptoms of widespread cerebral destruction. The initial phase may be ushered in by a chill, and within a few days or weeks, convulsions, hemiplegia (often complete) and stupor develop with Cheyne-Stokes' breathing, slow pulse and death.

Case 3. Brain abscess of otitic origin (temporal lobe). A girl, aged eight, was brought to the Mayo Clinic because of headaches, vomiting and drowsiness. Eight weeks before she had had tonsillitis, cervical adenitis and left otitis media. There was a spontaneous rupture of the ear drum with profuse purulent discharge. Three weeks later she complained of severe frontal headache, developed a temperature of 101°, and became drowsy and dull. Shortly after this she had several generalized convulsions with her head and eyes drawn to the left, and the clonic movements were more marked on the right side. Three weeks before, mastoidectomy had been performed but the mastoid cells, the dura and the sigmoid sinus were found to be normal. Slight improvement followed operation, but a week before her arrival she had become drowsy again and her headaches had increased and nausea and vomiting began. She was found to be dull, sleepy and aphasic. The mastoid wound and infected ear were in good condition with practically no discharge. Her temperature was normal but her pulse was as slow as 50 beats each minute. Her leukocyte count was 6,600. There was slight edema in the optic discs with a right homonymous hemianopsia, chiefly in the upper quadrant. There was tenderness to percussion over the left temporal region. A left subtemporal cerebral decompression was performed and the temporal lobe explored with the evacuation of 60 c.c. of thin, watery pus under considerable tension. Convalescence was rapid and recovery was complete.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of brain abscess represents the summary of all that has been said before. The various suppurative diseases inside the cranial cavity may produce clinical syndromes that blend one with the other so that differentiation is well-nigh impossible, but there are certain salient features that are worth remembering. Suppurative otitis

DIFFERENTIAL DIAGNOSIS

	Leptomeningitis	Sinus thrombosis	Brain abscess
Temperature	High, steady	Remittent	Normal or slightly elevated
Pulse	Rapid	Rapid, feeble	Slow, full
Optic disc	Normal	Normal	Papilloedema
Spinal fluid	Turbid or purulent; contains organisms	Turbid	Normal, or with slight increase of cells
Mentality	Irritable, delirious	Alternating clear and delirious	Dull, apathetic
Special features	Nuchal rigidity; Kernig's sign	Positive blood culture; septic emboli	Focal signs of cerebral compression

media with extradural abscess may produce signs very like those of cerebral abscess even to the extent of edema of the optic nerve, but careful examination and surgical exploration of the ear will cause a subsidence of symptoms and the diagnosis will then be clear. Diffuse suppurative leptomeningitis is differentiated by rigidity of the neck, delirium and restlessness, a rapid pulse, high fever, and a cloudy, purulent condition of the spinal fluid. Sinus thrombosis has its pyemic symptoms of rigor, sweats, and septic fever; and culture of the blood is usually productive of organisms. In contrast to these phenomena is the dull, drowsy, slow mentality, the slow pulse with normal or slightly elevated temperature, the optic papilloedema, vomiting and headache, the area of local tenderness to percussion on the skull, and lastly, the specific localizing cerebral or cerebellar signs of abscess of the brain.

BRAIN CYST*

A. A. Mathews, M. D.

SPOKANE, WASH.

Case 1. Mrs. J. V. P., No. 0340. January 24, 1924, was referred to me by Dr. Gilliland of Pullman. Age 32. Married. White. Has two children.

Family history of no consequence or bearing on the case. Past history to the beginning of her trouble of no consequence except that she has been more or less subject to headaches all her life and for the past several months has had severe ones coming on at variable times, located on the right side of her head, extending back to occipital region. These headaches were intense with lightning-like flashes of pain, which were relieved by hot wet fomentations. Sometimes they extended over quite a long period before relief could be had. Often there was an explosive vomiting. Especially was this the case when she had these headaches. Her mother states that she has on three or four occasions fallen, but she has no recollection of this and denies same. There were no convulsive seizures at these times, they being more of a swoon.

In the latter part of August she noticed there was a weakness in her left thumb. Was unable to hold dishes, etc., they falling from her hand. This weakness gradually increased until now she has a complete paralysis of the left arm, which has been complete for about four months. There was also a weakness in the left leg, beginning a short while after she noticed the paralysis in the arm. This has also been progressing. Now she has a complete paralysis of the left arm and almost complete of the leg, being able to move it a little, but this seems to be by the muscles of the hip.

Tactile sense is somewhat impaired on the whole left side and there is some paralysis of the face which involves the lower portions only. Her knee jerk is exaggerated and there is a babinski in the left foot. The abdominal reflexes are absent. There is no choked disc but there is a beginning optic neuritis. The spinal fluid pressure 12 negative. Blood and spinal fluid give negative Wassermann. X-ray of the head negative.

Dr. George Price examined this case with me and his diagnosis was a subcortical tumor under the midmotor area on the right side.

On February 1, a flap on the right side of the head was turned down about 3 x 3½ inches over motor area, there first being a tourniquet applied around the scalp to prevent hemorrhage. When the dura was opened the brain bulged through, showing considerable pressure. It was smooth, all convolutions having been obliterated; no pulsation. Upon palpating the brain I was not able to detect a tumor.

The blood pressure was taken throughout operation, which was at the start 110 systolic and gradually dropped to 88. Although the pulse was good and she appeared to be in splendid condition, we deemed it unwise to proceed further, so the flap was replaced and patient sent to bed.

She was brought back to the surgery on February 5, when her general condition was much improved. At this time an incision was made through the cortex of the brain about the middle of the central fissure, extending forward. We cut down upon the cyst, which was opened by puncturing with a sharp hemostat, letting out about one-half ounce of fluid. The cyst was very thin and friable. It was impossible to remove intact, but by piecemeal we succeeded in removing about two-thirds. There was no hemorrhage where the sac was removed from the brain substance.

Patient stood the operation well. Blood pressure at the time of this operation was 130, and dropped to 108.

She made an uneventful recovery and the evening following the operation was able to move her hand and thereafter rapidly improved in every way.

I neglected to say at the time of first operation with a syringe I aspirated a dram of fluid light yellow in color, which coagulated almost immediately after being withdrawn and gave a heavy albuminous ring with nitric acid. I regret that I did not aspirate the fluid from the cyst before opening so that I could have compared these fluids. At this time I was not certain whether this fluid came from the cyst or ventricles, but as it coagulated so quickly and gave a heavy albuminous ring, it made me feel it was cystic rather than the normal cerebral fluid.

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* Read before the Meeting of North Pacific Surgical Assn., Dec. 12, 1925.

Patient made an uneventful recovery, leaving the hospital wonderfully improved and almost back to normal. She herself thought completely cured, but the family were warned about the probability of the condition recurring. After two months the only thing that she noticed was that she got tired after working, and after walking long distances her left side seemed to be rather exhausted or played out.

September 18, 1924, she reported again, stating that in the latter part of June she noticed a little stiffness in the fingers of her left hand and this condition has slowly gotten worse. Now she has not a great deal of use of them, the leg also showing evidence of weakness and a drawing sensation in the knee. Has been much constipated and has gradually gained in weight, up to two months ago.

Upon examination at this time the left hand was quite weak and she had very little use of it. Left leg was weak but was able to get about on it fairly well. She had two severe spells of headache in past two weeks. Abdominal reflexes on left side were diminished and left knee jerk exaggerated. No babinski.

She refused any treatment and I did not hear from her again until this past June, at which time the family physician reported to me that she had not gotten any worse and if anything thought some slight improvement was noticeable.

On August 15, 1925, she came to see me again and at this time was in much the same condition as before the first operation. So I opened her head again, turning back the same flap and removing quite a lot of fluid, fully an ounce to an ounce and a half. Replaced the skull flap, but before doing so removed ½ x 1 inch of bone, leaving a window for the purpose of aspirating in case this refilled, which I expected it to do.

She made an uneventful recovery, leaving the hospital in fifteen days following operation. I have received favorable reports from her since. The family physician reported that her paralysis had cleared up considerable and she was feeling very well but it was necessary for him to aspirate the cyst occasionally, which is done through the scalp with an aspirating syringe. He has gotten as much as one ounce of fluid, but it is decreasing in quantity. She has had one convulsion since the last operation and this was due to letting her go three weeks between tappings. Another report on December 1 gave the same condition.

In response to an inquiry, her physician wrote, on November 18, 1925, stating that the patient was able to get about herself and does not complain. Has very little use of left arm and leg. He continues to draw off about an ounce of fluid from brain cyst each week. States there are two cavities, one containing a clear fluid and the other bloody. I have advised deep x-ray therapy.

Case 2. Brain tumor, possibly glioma.

Miss E. S. Age 20. White, Female. Student Nurse. Was examined by a physician on June 6, 1926, and gave the following history:

"Attacks of nausea and vomiting, the first in February, 1925, lasting three or four days, attacks appearing every three or four weeks. Patient feels that there is some connection with menstruation, as she is much nauseated three days previous to menstruation and five days after, having no nausea or vomiting during the actual menstrual period. Periods have been regular, last beginning May 24 and ending May 29, there being considerable more flow than usual. She has some headache over eyes, which is more frequent of late, especially after eating. At this time she was in the hospital under observation for a number of days, and a diagnosis of periodical neurotic vomiting was made."

On November 27, 1925, she fell into the hands of another physician and was in the hospital also for several days, the following record being made:

"Patient was found unconscious in bed last night, was rigid, reflexes exaggerated, pulse 140 but good, respiration regular. There was a great deal of mucus in mouth, nose and throat. She was given apomorphine and vomited large quantities of undigested food. Shortly afterward the rigidity disappeared. Today, November 28, her sypmtoms are headache, frontal, severe in character, pain in right shoulder and arm, twitching of muscles of left face. Diagnosis made at this time, hysteria.

"On January 17, 1926, she came under the care of Dr. Frances Eastman Rose, whose records show family and past history up to time of present trouble beginning to be of no consequence in regard to the trouble. When seen by Dr. Rose the patient had been in a state of catalepsy for an hour, with arms, fingers, lower extremities and toes in complete extension, pupils widely dilated, corneal reflex present. All other reflexes absent. Skin cold and dry. At the time of attack was playing victrola and apparently fainted, falling to the floor, then became rigid.

"A history was secured from her family similar to that given previously. Following this attack she was confined to her bed for ten days because of asthenia and muscular weakness. She could use the right eye if the left was covered. There was more or less persistent facial twitching on the left side. Diplopia was present. She complained of a headache both in the frontal and parietal areas. This headache, the mother believes, precedes the attacks. Now little things worry her very much. She picks and tears paper constantly, bites finger nails, and has a desire to dress up and look well. There was some cardiac palpitation and pulse was dicrotic. She had an enlarged thyroid, which is normal now. Abdominal reflexes present and active. Left patella reflexes decreased, right very active.

"Blood: Hemoglobin 99 per cent. W. b. c. 12,630, r. b. c. 4,540,000.

"Spinal fluid: Pressure, 32 mm., cell count, 1 per cmm., globulin tests, not increased. Colloidal gold reaction, 000000000.

"X-rays by Drs. Ward and Betts all negative."

On January 19 she was seen by Dr. George E. Price, whose report was as follows:

"Romberg slight. Optic neuritis most marked in the right eye. Occasional slight speech defect. Occasional twitching of the muscles about the left corner of the mouth, left hand and arm. Marked sensory diminution of the organic type, affecting the entire left half of the body. Stereognostic sense definitely diminished in the left hand. Slight dysmetria of the left hand. There is also a very marked increase in the pressure in the cerebrospinal fluid, without any other findings. I believe Miss Shellman has a brain tumor on the right side, in the parietal region, subcortical and fairly low."

On February 5, she was again examined by Dr. Price, who reported the following:

"Romberg more marked than when last examined. The pupils were unequal, the right being the larger. Sensory disturbance had increased and stereognostic sense was completely lost. Left homonomous hemianopsia is now apparently developing."

On February 6 she was seen by Dr. R. Sprowl, who reported as follows:

"Bilateral optic neuritis, formerly right eye, now both. Definite hemopina, vision formerly 20/30, now 16/30. Has diplopia, not definite in statements. Believe she has an intercranial growth."

On February 15 I operated, assisted by Dr. Frances E. Rose, at which time I turned back a large osteoplastic flap, 2 x 3 inches, over left motor area, opening dura. The convolutions of the brain were almost completely flattened out. Used an aspirating needle to see if could locate a cyst, but found nothing.

Patient stood operation well and made a quick and uneventful recovery and was perfectly normal until on or about June 1, when her old symtoms began to recur, with pain in the left eye with a pulling sensation. Subsequent to these symtoms the pupil of the left eye became very small and the right pupil enlarged. On using eyes a white spot appeared over the left eye, patient being blinded by it. Conjunctive of the left eye more or less infected all of the time.

On July 4 she was having projectile vomiting, blindness, dizziness, twitching of extremities and severe headaches. At this time she was seen by Dr. Price, also Dr. Adson of Rochester, Minn., and it was deemed advisable to do a subtemporal decompression, as the ospeoplastic flap raised formerly had become firmly united, consequently allowing an expansion. Then give deep x-ray treatments.

On July 5, I did a subtemporal decompression on the left side assisted by Dr. Rose, and then deep x-ray treatments were given as stated below, by Drs. Ward and Betts.

Date	Area treated	Milliam-perage	Time	K.V.	Filter
7-28-26	Left side head	5	45 min.	200	1 mm. Copper
7-28-26	Right side head	5	45 min.	198	1 mm. Copper
7-29-26	Right side head	5	45 min.	200	1 mm. Copper
7-29-26	Left side head	5	45 min.	200	1 mm. Copper
9-15-26	Left side head	5	45 min.	200	1 mm. Copper
9-15-26	Right side head	5	45 min.	200	1 mm. Copper
9-18-26	Left side head	5	35 min.	192	1 mm. Copper
9-18-26	Right side head	5	35 min.	192	1 mm. Copper
10-12-26	Left side head	5	24 min.	200	½ mm. Copper
10-15-26	Right side head	5	24 min.	200	½ mm. Copper

All treatments given at 20-inch distance.

She has completely lost her hair, and with this exception seems to be perfectly normal.

On November 20 she was again examined by Dr. Price, whose report was as follows:

"Upon examination today I find the situation normal. No pupillary inequality. Incomplete or partial hemianopsia. No dysmetria. Sensation lost to brush and to pin prick, but retained for pressure over the entire left half of the body, head and extremities. Stereognostic sense markedly disturbed in the left hand.

"Conclusion: There is an entire disappearance of all of the general symtoms, with considerable improvement in the local symptoms. I would consider it probable that the maximum of improvement has been reached."

CEREBROVENTRICULOMYELOGRAPHY WITH CONCLUSIONS*

AN HISTORICAL SKETCH

DORRELL G. DICKERSON, M.D.
AMERICAN LAKE, WASH.

Prior to 1919 neurologists and neurosurgeons were largely dependent upon neurologic localization and roentgenologic studies for the regional diagnosis of intracranial and spinal cord neoplasms. In 1919 Dr. Walter E. Dandy of Baltimore published in the *American Journal of Roentgenology* an article entitled, "Ventriculography Following Injection of Air Into the Cerebral Ventricles." Any procedure which could improve upon our methods of intracranial localization was enthusiastically received. This diagnostic method was at once taken up by interested workers and reports soon began to appear from the neurologic clinics of America and Europe. It has now been nearly eight years since the appearance of the first publication on ventriculography, and during this period considerable statistical evidence has been accumulated on the subject. It is felt that the numerous reports from such widely separated observers have been such that we can begin to draw conclusions as to the dangers, limitations and value of cerebroventricular studies.

Dandy's original method was the intralumbar route. He soon abandoned this, however, as a formidable and dangerous procedure and advocated the direct or intraventricular method. The originator of the direct cerebroventricular method has repeatedly warned against the use of the indirect or intralumbar route. The intraventricular method of Dandy consists in making a small trephine opening over the anterior, posterior or inferior horns of the lateral ventricle on one or both sides. He then removes from five to ten cubic centimeters of spinal fluid and replaces this by an equal quantity of air.

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* Read before Pierce County Medical Society, Tacoma, Wash., May 25, and before Seattle Surgical Society, Seattle, Wash., May 28, 1926.

This is repeated until the quantity of spinal fluid withdrawn and the air replaced ranges from twenty-five to one hundred cubic centimeters. This, of course, is recognized as a major surgical operation. The intralumbar method is performed in exactly the same manner as a routine lumbar puncture, the quantity of fluid withdrawn being replaced by an equal quantity of air.

Dandy, Wideroe and Bingel seem to have developed the intralumbar method independently. Authorities credit Dandy with the discovery of the intralumbar method; others, however, feel that Bingel should receive great credit, in view of the fact that he fearlessly undertook and carried on this method against great objection and much criticism after its rejection by the originator. A review of the literature shows that Bingel perfected the intralumbar method and demonstrated the value of the indirect cerebroventricular study. We should not lose sight of the fact that Dandy's original pneumoventriculography has been the greatest aid in the localization of intracranial lesions. Neurosurgery owes a great debt to Dandy. The fact that Bingel's publication appeared practically simultaneously with that of Dandy would lead us to believe that both of these pioneers in the field of neurosurgical localization should receive equal credit.

In the *Norsk Magazin foer Loegevid* (*Norwegian Magazine of Psychotherapy*) for July, 1921, there appears an article written by Wideroe, the Norwegian observer, in which he reports cases of spinal cord tumor diagnosed by the intralumbar insufflation method. It is reasonable to presume that he received his inspiration from the work done by Dandy and Bingel. A careful perusal of the literature indicates that Wideroe was one of the first workers in this new field to report definite localization of spinal cord neoplasm by the intralumbar method. Dandy had suggested that it might be possible to localize obstructing lesions of the spinal cord by the column of air accumulating below the lesion demonstrable in the roentgenogram. Wideroe did not observe air below the obstruction. He reported that within a few minutes following the introduction of air by the lumbar puncture route the patient complained of sharp pain, referred to the region of the obstruction at the seventh cervical segment. He localized the lesion at this segment and an exploratory laminectomy proved the diagnosis to be correct.

To Bingel is due the credit of having worked out independently the use of air in the diagnosis of spinal cord tumors. An account of his original work appears in the *Fortschritte auf dem Gebiet der Roentgenstrahlen* for August, 1921. His observation of the complaint of pain at the site of the tumor practically confirmed Wideroe's clinical observations. Later he made application of this method to intracranial lesions and in a series of forty cases injected air into the spinal subarachnoid space by the lumbar puncture method in sufficient quantity to fill the cerebral ventricles. This observer considers the method of intralumbar insufflation devoid of danger.

The literature shows that within a period of nine months Bingel published five papers, in which he related his experiences with the use of air by the lumbar puncture method. In May and August, 1923, two articles written by him appeared in the *Deutsche Zeitschrift für Nervenheilkunde* on the use of air by the lumbar puncture method. In his second paper he mentions three possible benefits to be derived from this procedure. First, his experience confirms the view that the level of the compressing lesion of the spinal cord may be determined by the localization of pain produced at the time of the introduction of air or shortly thereafter. Second, it is possible to remove a much larger quantity of cerebrospinal fluid and secure, by lumbar puncture, fluid from the subarachnoid spaces of the brain and all of the cerebral ventricles. Third, he believes that it is possible to determine the capacity of that portion of the spinal subarachnoid space below the site of the obstructing lesion. Bingel made three hundred injections of air by the intralumbar route before he had his first fatality. In this case he used carbon dioxide gas and believes that the rapid absorption produced a hemorrhage into the tumor, the patient dying fifteen hours following the introduction of the gas.

Josefson published in the January, 1922, issue of *Hygeia* an article on the localization of transverse lesions of the spinal cord by means of air following the intralumbar method. He seems to have been one of the first observers to localize transverse lesions of the spinal cord by this method. It is interesting to note that in one of his cases the patient made no complaint of pain at the site of the obstruction following the introduction of air by the lumbar puncture route. He was one of the first observers to demonstrate subarachnoid spinal block by the use of air. Wiegeldt has in all fourteen of his spinal cord cases observed localized pain at the level of the obstructing growth.

In May, 1922, the *Bulletin of Johns Hopkins Hospital* contained an article written by Dandy, in which he describes the intralumbar method of air injection and records five cases of suspected cord lesion, in which the air pasesd into the subarachnoid space and into the cerebral ventricles, thus practically excluding total spinal subarachnoid obstruction. He calls attention to the necessity for careful study of the abdominal and thoracic shadows in the median vertebral line in differentiating shadows cast by air in the subarachnoid space of the spinal canal.

The October, 1922, issue of *American Journal of Diseases of Children* contains an article written by Penfield on the diagnosis of internal hydrocephalus. He describes in detail how this diagnosis was arrived at, following the use of the combined intraventricular and intralumbar insufflation methods. No bad results were observed.

A personal communication from Tremaine of Boise, Idaho, records his observations on eight or more intralumbar injections of air made in young children. In no case did he observe untoward effects and the procedure led to a correct diagnosis in practically every instance. This seems to be an important observation, having been performed on small children, some of whom had a rather marked degree of internal hydrocephalus and other obstructing lesions.

Grant reviews the experiences gathered from a careful study of approximately 'forty patients in Frazier's Clinic in Philadelphia. This appeared in the August, 1923, issue of *Archives of Neurology and Psychiatry*. It is interesting to note that in fifteen cases ventriculographic findings were confirmed at operation or autopsy. He states that in eight the localization probably was correct. In four other cases the results were misleading, due apparently to errors in technic. He further states that five patients died, but fails to mention the cause of death, whether it was due to the introduction of air or to the lesion. Grant has reviewed the statistics gathered from six different neurosurgical clinics in America and shows a mortality rate of approximately 9.25 per cent following the intraventricular introduction of air. A careful study of the literature fails to disclose any report of serious injury or death following the intralumbar method, perhaps with the exception of the isolated cases reported, such as the one described by Bingel, in which he used carbon dioxide gas.

Sachs, the neurosurgeon of St. Louis, in discussing Dandy's paper on pneumoventriculography read before the Missouri State Medical Association in 1920, calls attention to the limitations and dangers of the intraventricular use of air, and cites cases in which anatomic deformity or congenital defect of the ventricular system not due to neoplasm or other lesion was frequently misleading and led to erroneous localization.

It is interesting to note that the November, 1922, issue of *Zeitschrift für die Gesamte Neurologie und Psychiatrie* contains an article written by Wiegeldt. This worker performed one hundred and four air injections on sixty-five patients. Most of these were by the intraventricular insufflation method. In some cases the air was introduced by the lumbar puncture route. He further states that under normal conditions asymmetries of the ventricular system are extremely rare and mentions the fact that this method, in his experience, has never failed to indicate the site of the tumor. Exact information of the contour of the ventricles was obtainable through the introduction of air and local narrowing or widening of a ventricular horn frequently gave valuable information. He remarks that the intralumbar method is more disagreeable to the patient.

Marburg summarizes the experiences gained in Eiselberg's Clinic. These records show that in three hundred eighteen cases the operation for brain tumor demonstrated only forty localized correctly by neurologic methods. He believes that the intraventricular introduction of air is preferable to the intralumbar route.

Dandy is of the opinion that about fifty per cent of the cases of brain tumor can be diagnosed by neurologic examination, that fifteen per cent can be diagnosed by the x-ray without the use of air, whereas thirty-five per cent can be correctly diagnosed by cerebroventriculography. He repeatedly warns against the use of air except in those cases which cannot be diagnosed by other means, and reiterates the fact that it should be used only when necessary.

Bailey studied a series of one hundred eighteen consecutive brain tumor cases, operated upon and thus confirmed. He found that 46.6 per cent were not localized or were misdiagnosed by neurologic methods.

Among other advocates and strong supporters of the lumbar puncture method are the German physicians, Foerster and Wortenberg. Foerster has made over one hundred air injections by both routes and considers the spinal method the safer, except perhaps in posterior fossa lesions. Wortenberg believes that the lumbar puncture method, when properly performed, is free from serious consequences. He advocates its employment for diagnosing cases other than suspected intracranial neoplasm. (*Zeitschrift für die Gesamte Neurologie und Psychiatrie,* 1925, Vol. 94.)

NORTHWEST MEDICINE for January, 1926, contains an article written by Sachs, and in this he mentions in passing the direct pneumoventricular method of Dandy and states that it may be used in those cases in which other methods of localization fail. He believes that it is a method attended by real danger and has a mortality rate of approximately eight per cent.

In the Pacific Northwest Dr. George W. Swift, neurosurgeon of Seattle, following the method of Bingel, has reported one hundred and fifty intralumbar injections of air. He is of the opinion that this diagnostic procedure is harmless if used judiciously. Drs. D. V. Trueblood and Herbert E. Coe of Seattle have performed a number of intralumbar injections of air without a reported fatality.

Dr. Frank Liberson of the United States Public Health Service reports in the March, 1926, issue of the *American Journal of Roentgenology and Radium Therapy* forty cases on which the intralumbar method was used. This group consisted of fourteen normal cases, two confirmed brain tumor cases, ten cases of lues of the central nervous system and six spinal cord tumors. The other cases were miscellaneous diseases of the central nervous system. His report contains no mention of serious effects from this procedure.

At U. S. Veterans' Hospital No. 94, American Lake, Washington, we have to date made twenty-two intralumbar injections of air without a single fatality and with no harmful results. The greatest inconvenience to the patient was a slight syncope, profuse perspiration, nausea and pallor. Emesis was observed in two cases; this was in all probability due to the noncooperation of the patients, who assumed a sitting posture following the introduction of the air. Patients with a neurotic tendency have shown more reaction than is normally expected. This method has assisted in the localization, chiefly by pain, of a spinal cord compression syndrome, which was confirmed at operation, and has in several cases led to the diagnosis of internal hydrocephalus, due apparently to cerebellar subarachnoid cyst. It has been used in cases of so-called idiopathic epilepsy, thereby ruling out or demonstrating organic brain lesion.

CONCLUSIONS

Based upon a study of all the literature available on the subject, the following conclusions have been reached:

1. There appears to be no reason why the intralumbar method should not be used.
2. The introduction of air into the spinal subarachnoid space for the diagnosis of spinal cord or intracranial lesions is a safe procedure.
3. In the hands of a skilled brain surgeon the direct intraventricular injection of air is justified. It is a major operation and cannot be used so conveniently as the intralumbar method.
4. In certain cases the combined intraventricular and intralumbar methods should be used.
5. When the neurologic localization is in doubt, the intralumbar injection of air is a safe confirmatory procedure in cases of organic brain and cord disease.
6. In cases of so-called idiopathic epilepsy the intralumbar injection of air will help to eliminate or to ascertain the presence of and localize gross brain pathology.

TWO FACTORS IN CATARRHAL DEAFNESS. Hypertrophy of the lower turbinate has long been known to be a most potent factor in catarrhal deafness (obstruction of the eustachian tube). Otologists have for many years amputated the posterior hypertrophy by means of a cold snare and this has frequently been a satisfactory procedure, but there are other cases in which the result may be obtained even after cold snaring has failed. The procedure employed by Greenfield Sluder, St. Louis (Journal A. M. A., Nov. 27, 1926), for this purpose consists in the destruction of the soft tissues of the posterior tip of the turbinate by means of the galvanocautery. One incision is made under the tip, another is made on top of the tip, and a third incision is made on the middle of the tip and is prolonged backward until it reaches the face of the eustachian tube. Then, from in front, the middle incision is prolonged forward as far as the judgment of the surgeon may indicate. The healing of this wound fixes the scar on the bony tip of the turbinate, and as it contracts in its maturity it draws the anterior lip of the tube forward more or less to open it. The operation is difficult as it must necessarily be done through the mouth, the field being visible only in the postnasal mirror; but when properly performed it has proved to be no more dangerous than any other postnasal surgery. A most important factor is that the nose once operated on should be left absolutely alone. No nasal washes or applications should be made to the wound. The anterior nostril should be closed by a cotton pack which should be left in place for a week. The second factor in catarrhal deafness is the sphenoid cell. The customary sphenoid cell is well known as limited to the body of the sphenoid; the prolongation of the cell downward into the pterygoid process even as far as the bifurcation of the plates occurs rather frequently.

HOW PREVENT CHILDHOOD INFECTION FROM BECOMING ACTIVE TUBERCULOSIS LATER IN LIFE *

F. M. Pottenger, M. D.
MONROVIA, CALIF.

THE BEARING OF VON PIRQUET'S AND RÖMER'S WORK ON OUR NEW CONCEPTION OF TUBERCULOSIS

The use of tuberculin in diagnosis dates back to the first tuberculin era in 1890-91. The early method of using the test, however, was by subcutaneous injection, which was not suitable for wholesale testing. It was a great advance when von Pirquet in 1906-7[1, 2] reported the fact that tuberculin could be used as a local skin test; because, as he had found, the skin of those who have been infected by tubercle bacilli is rendered hypersensitive to the bacillus and its products.

The testing of large groups of people revealed a fact wholly unexpected, that children who were apparently in all respects healthy were sensitized to tuberculin. Not only some children but nearly all children, as shown by Hamburger[3], in Table I, reacted by the time they had attained the age of fifteen years. The accuracy of Table I is supported by the statistics from Harbitz,[4] shown in Table II. This surprising prevalence of tubercle infection furnished new problems for solution; for while these children showed infection and were sensitive to tuberculin, they were not ill of tuberculosis. It will be interesting to note to what degree both total and massive infection will be reduced by the intelligent application of present known methods of preventing the spread of bacilli.

TABLE I

PERCENTAGE OF CHILDREN REACTING TO TUBERCULIN ACCORDING TO AGE PERIOD. TEST REPEATED WHEN NEGATIVE (VIENNA)

46 children in the	2nd year of whom	4	or 9 per cent reacted
56 children in the	3rd year of whom	11	or 20 per cent reacted
75 children in the	4th year of whom	24	or 32 per cent reacted
50 children in the	5th year of whom	26	or 52 per cent reacted
63 children in the	6th year of whom	32	or 51 per cent reacted
46 children in the	7th year of whom	28	or 61 per cent reacted
30 children in the	8th year of whom	22	or 73 per cent reacted
35 children in the	9th year of whom	25	or 71 per cent reacted
26 children in the	10th year of whom	22	or 85 per cent reacted
29 children in the	11th year of whom	27	or 93 per cent reacted
19 children in the	12th year of whom	18	or 95 per cent reacted
17 children in the	13th year of whom	16	or 94 per cent reacted
17 children in the	14th year of whom	16	or 94 per cent reacted
509		271	

Much experimentation was then carried out to determine the meaning of the tuberculin reaction, and it was found that the formation of tubercle, in others words, infection, is essential to the establishment of the conditions which produce the tuberculin reaction. This means that all children who react to tuberculin when applied to the skin have been previously infected with bacilli. The natural corollary to this is that infection does not mean disease; there is a difference between tuberculous infection and tuberculous disease. This fact is basic to our understanding of not only clinical tuberculosis but the prevention of tuberculosis also.

The interpretation of the meaning of the tuberculin test and the significance of the immunity created by previous infection was studied most carefully by Römer [5,6]. In his phenomenal studies he clarified the nature of the acquired resistance to tuberculosis and greatly advanced our knowledge of the relationship of early infection to clinical disease. He showed that a primary infection often prevented bacilli, which were later injected subcutaneously, from becoming implanted.

It is Römer's work especially which established the conception that the chronic form of adult tuberculosis is probably due to metastatic infection from foci which resulted from childhood infection; and further that the chronic nature of the adult type of the disease is a result of the immunity gained by the implantation of bacilli which resulted in tubercle formation in early life.

Koch[7] had observed in some of his very early experiments that primary subcutaneous infection is not accompanied by inflammatory reaction at the site of inoculation, but that such an inoculation in an animal already tuberculous is accompanied by inflammation and sloughing at the point of injection. He further stated that the bacilli in the nontuberculous animal escaped freely from the seat of inoculation and even found their way to the regional lymph glands and into the general bloodstream, while in the tuberculous animal the bacilli were hindered in their passage through the tissues. Something held them at the point of inoculation, and there was even an attempt at ridding the animal of them through a sloughing process. Regional lymph glands took little part in the defense and the bloodstream was only attained by the bacilli at

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* Abstract of address delivered before the Tuberculosis Institute for Nurses, University of Minnesota, Minneapolis, June 14-19, 1926.

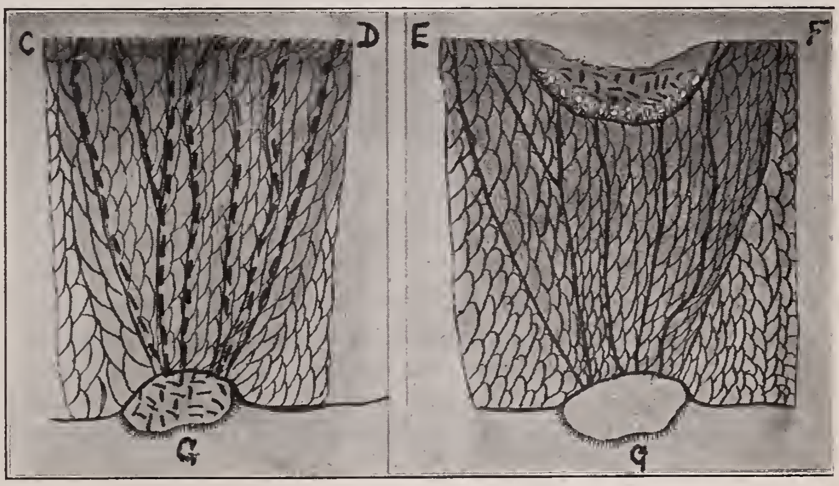
TABLE II

PERCENTAGE OF CHILDREN SHOWING TUBERCULOSIS INFECTION ON POSTMORTEM EXAMINATION

AGE		Number of those Examined	Free from Tuberculosis		Infected with Tuberculosis		Died of Tuberculosis	Latent Tuberculosis	Latent Tubercle Bacilli
1st year....	1st quarter............	82	76	%	6	%	4		2
	2nd quarter............	55	46		9		4		5
	3rd quarter............	36	20		16		10	1	5
	4th quarter............	28	19	80	9	20	6	2	1
		201	161		40		24	3	13
2 years............................		65	48	74	17	26	14	1	2
3 years............................		26	18	69	8	31	4	1	3
4 years............................		18	12	67	6	33	5	1	....
5 years............................		16	7	44	9	56	8	....	1
6 years............................		12	2	20	10	80	8	1	1
7 years............................		13	7	54	6	46	3	....	2
8 years............................		20	7	35	13	65	6	6	1
9 years............................		9	3	33	6	67	3	2	1
10 years............................		11	3	27	8	73	4	4	....
11 years............................		14	1	7	13	93	7	4	2
12 years............................		13	4	31	9	69	6	3	....
13 years............................		13	4	31	9	69	4	5	....
14 years............................		13	1	8	12	92	4	8	....
15 years............................		40	8	20	32	80	19	13	....
		484	286	59	198	41	119	52	27
			484				198		

a late period. Krause[8] has shown that the difference in time of bacilli gaining access to the blood-stream is three to four days in the nontuberculous animal, and three to four weeks in the tuberculous.

This observation of Koch was the first recognition of the property of producing a specific inflammatory reaction which is granted to the body cells by a primary infection, the first observation of allergy, which is now recognized as an essential factor in the body's specific protective mechanism against bacilli.



a b

Fig. 1. a, and b illustrate schematically the difference in behavior of tissues towards invading bacilli. In a, specific defense has not been established by previous infection. The bacilli pass through the lymphatic channels to the lymph glands quickly. In b, specific defense has been established by previous infection. Bacilli are held in check immediately under the skin at the point of injection. The tissues between the point of injection and the gland, as well as the gland itself, remain free from infection for a considerable time.

Fig. 1, a, and b, is a schematic representation of the difference in action of the body in the presence of primary and secondary inoculation of tubercle bacilli. In a, the inoculation of bacilli occurs for the first time and the bacilli readily pass through the tissues to the neighboring lymph glands; while in b, the inoculation occurs in tissues which, because of previous infection, have acquired the specific immunity reaction known as allergy, through which a defensive opposition is at once presented to the invading bacilli, hindering their passage to such an extent that only a few are able, and this only tardily, to pass beyond the point of inoculation and gain access to the neighboring lymph glands and the general circulation.

SOURCES OF INFECTION

Whence comes this all but universal infection? This question cannot be answered too dogmatically. We assume that the bacilli which produce human infection are either of human or bovine origin, but personally I do not believe the last word has been said as to the relative frequency of the two sources.

In discussing this question in *Clinical Tuberculosis*[9] I quote statistics as shown in Table III from Park and Krumwiede,[10] who analyzed 1,038 carefully studied cases of tuberculosis, and showed that prior to eleven years of age about 75 per cent of cases of tuberculosis were caused by human bacilli and 25 per cent by bovine, and after sixteen years 98.69 per cent were due to human and only 1.31 per cent to bovine bacilli. Also Table IV presents an analysis of 1400 cases studied by the Imperial German Board of Health, showing the number of cases of particular types of the disease with the strain of bacillus responsible for each, in which the percentages in childhood and adult life are compared.

TABLE III—from Park and Krumwiede

Age Period	Per cent of Human Tuberculosis	Per cent of Bovine Tuberculosis
0— 5 years	73.5	26.5
6—11 years	75.	25.
16 years and over	98.69	1.31

When Koch[11] at the London Congress in 1901 declared that human and bovine tuberculosis were different and that there was no danger to human beings from infected cattle, he called attention to the very important but previously hardly suspected fact that human bacilli differ from bovine bacilli. He was wrong in stating that there was no danger to human beings from bovine bacilli. In fact, there is no way of telling how great this danger is. He was correct in his statement that the bacilli differ.

What seems to me to be the most important fact bearing on the question of transmissibility of bovine bacilli to the human race is that, while we recover bovine bacilli from a considerable number of such childhood forms of tuberculosis as that of the miliary and general tuberculosis, we rarely find them in the adult forms, particularly tuberculosis of the lungs. We must assume either that little bovine infection occurs in those who develop clinical tuberculosis in adult life or that the bovine bacilli which are taken into the body during childhood gradually adapt themselves to the human soil, and are transmuted to human bacilli[12]. This assumption seems perfectly reasonable and in accordance with the powers of adaptation to different media which is shown by bacilli in laboratory cultures.

Therefore, we must recognize bovine bacilli as potentially able to produce a considerable but an unknown percentage of clinical tuberculosis during both childhood and adult life. An adequate program of prevention of tuberculosis must recognize childhood as a time when infection occurs very generally and institute protective measures against contact with persons suffering from open tuberculosis and against the use of raw milk from dairy cattle infected with tuberculosis. It is best to use only milk from tuberculin-tested cattle, but where this cannot be had pasturized milk may be used.

The danger of infection is the greater the more intimate the contact. This danger manifests itself in a greater proportion of early infections in children who associate intimately with open tuberculosis, as will be seen by comparing the percentage columns in Table V from Fishberg[13]; and also in infections produced by larger numbers of bacilli, both of which conditions increase the likelihood of the child at once or later developing an active clinical tuberculosis.

TABLE IV

From the Imperial German Board of Health.

	Total Number Investigated Cases	TYPES		Per Cent of all Cases Due to Bovine Type	
		Human	Bovine	In Adults	In Children
Tuberculosis of the lungs	811	807	5	0.66	0.
Tuberculosis of the bones and joints	99	95	5	6.66	4.3
Meningeal tuberculosis	33	30	3	0.	10.34
Generalized tuberculosis	178	147	33	2.5	23.18
Tuberculosis of the cervical glands	167	120	47	5.8	40.7
Tuberculosis of the mesenteric glands	112	78	35	12.0	51.0
Totals	1400	1277	128		

TABLE V—(Fishberg)
PERCENTAGE GIVING POSITIVE REACTION

Age	Children of Tuberculous Parents		Children of Non-Tuberculous Parents	
	Number of Cases	Per Cent	Number of Cases	Per Cent
Under 1 year....	33	15.15	56	10.07
1 to 2 years.....	49	55.10	39	33.33
3 to 4 years.....	90	68.88	80	41.25
5 to 6 years.....	95	65.26	106	50.00
7 to 10 years....	244	71.31	173	64.74
11 to 14 years...	181	74.58	134	69.40
14 years........	37	83.79	20	75.00
Total.......	729		608	

RESULTS OF EARLY CHILDHOOD INFECTION

When a child first becomes infected with tubercle bacilli, a very important chain of events ensues. The bacilli become enmeshed in the body cells which proliferate and attempt by mechanical means to surround them and wall them off, the same as they would in case of other particles of foreign material.

This purely mechanical action, however, does not last long for both bacilli and body cells are living, and vital action comes into play. The bacilli attempt to make conditions congenial to them and favorable for their growth and multiplication. The cells, on the other hand, attempt to destroy the invading bacilli. In order to do this they develop an entirely new property which they had not possessed until they came in contact with bacilli and bacillary products. This is the property of minimizing the activity of, preventing the spread of, and destroying bacilli.

This property constitutes the mechanism of immunity. It is not constant but increases each time that an infection or spread of infection is overcome. It increases as clinical tuberculosis advances, even though the patient may eventually succumb to the disease. This is evident from the fact that, while a few bacilli will infect an individual who has not previously been infected, a patient with advanced tuberculosis will cast off millions of bacilli from the ulcerated surfaces in the lungs which will pass over the bronchial surfaces without implantation occurring. It decreases during certain infections, such as measles and influenza and also under various stresses of life.

The nature of this immunity is still somewhat obscure. The fact that not only the cells surrounding the tubercle but all cells of the body develop specific immunizing properties shows that the products of the bacillus which stimulate this property gain access to the cells through the circulation.

Of possible properties conferred upon the cells which belong to the immunizing response two stand out very prominently. First of these is the property of producing substances which destroy the bacilli. This is evident from the fact observed particularly after inoculating a tuberculous animal intraperitoneally with bacilli. In a very few minutes the bacilli are degenerated and only a few of them are to be found, suggesting that a destructive action has occurred. The second property is that of reacting with an inflammatory process wherever bacilli are found imbedded in the tissues.

Evidence of the development of a specific immunizing mechanism is shown in the decrease in percentage of mortality and increase in chronicity which follows the advances in age periods, as illustrated in Tables VI and VII from Hamburger[14]. Chronicity begins to show markedly in the late years of childhood and after the age of fifteen nearly all clinical tuberculosis is of the chronic type.

It is now generally believed that nearly all clinical tuberculosis met in the adult years of life is due to metastatic implantation from childhood in-

TABLE VI (Hamburger)
MORTALITY OF TUBERCULOUS BY AGE PERIODS

	I			II	III	IV	V	VI
	1 Year							
	0 to 3 months	4 to 6 months	7 to 12 months	2 years	3 to 4 years	5 to 6 years	7 to 10 years	11 to 14 years
Number of cases..........	4	49 13	32	74	102	38	41	31
Fatal cases...............	4	44 13	27	51	69	23	28	16
Percentage of fatality......	100%	90 100%	80%	70%	67%	60%	68%	50%

TABLE VII (Hamburger)
FREQUENCY OF HEALED TUBERCULOSIS BY AGE PERIODS

	1 Year	2 Years	3 to 4 Years	5 to 6 Years	7 to 10 Years	11 to 14 Years
Total number of cases	49	74	102	38	41	31
Number with signs of healing	0	0	7	4	7	10
Percentage showing healing	0	0	7	10	17	33

fections. While infections from without are not wholly denied, yet it is difficult to persuade oneself that an allergic reaction which will prevent bacilli from entering the bronchial mucous membrane of a patient with advanced tuberculosis would be unable to ward off bacilli coming in contact with the tissues via the air passages. And it seems almost inconceivable for bacilli to gain access to the lung through other portals of entry, such as the intestinal tract, in the presence of allergy. Infection could take place with comparative ease, however, at times when allergy is temporarily in abeyance.

The important results of childhood infection, then, are two: (1) the development of a specific immunizing mechanism; (2) the establishment of areas of infection, from which bacilli escape to form metastases which may result in future clinical tuberculosis.

HOW PREVENT CLINICAL TUBERCULOSIS

The younger the child when infection occurs the less its chance of overcoming it. Therefore, it is especially desirable to shield children from infection during infancy and early childhood.

All else being equal, infections with large numbers of bacilli are more difficult to overcome than infections with few. Therefore, it is essential to shield children from intimate association with those suffering from open tuberculosis and also protect them from the use of infected milk.

When infection has once occurred, the possibility of activation with metastasis should be borne in mind. The picture which represents these early spreads of infection should be familiar to all who have care of children. From the time of the primary focus to the development of definite symptoms the chances are that several or many small foci of infection are overcome. If the metastasis is not caused by too many bacilli, or if too many foci do not develop at one time, there is little or no danger; a heightening of immunity only results. But, on the other hand, if a large focus or several foci become established, then clinical symptoms may appear. Whenever tuberculosis is so marked as to make its presence known by symptoms, the individual needs special care if he is to overcome it.

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ARTIFICIAL PNEUMOTHORAX

PERSONAL EXPERIENCES IN ITS USE*

Robert A. Peers, M.D.
COLFAX, CALIF.
Colfax School for the Tuberculous

It is my intention to give my personal experiences with the use of artificial pneumothorax and not to review the literature, nor to enter into a discussion of the details of the technic of operation, nor to attempt to explain except perhaps briefly the beneficial results of the procedure.

We first began using lung compression in 1914 and since that time we have compressed 402 cases. The equipment used has been from the first the Floyd-Robinson apparatus, which was purchased in Boston in 1914. We have seen many different types of apparatus from simple home made equipment to very elaborate and complicated instruments and have observed their use in the hands of many operators, and it is our opinion that results depend not upon the type of instrument but upon the skill, experience and judgment of the operator.

Originally we used nitrogen gas for inflation of the pleural cavity but we very shortly changed to the use of ordinary atmospheric air which we consider to be entirely satisfactory as well as possessing the advantages of being without cost and always available in unlimited amounts.

It has been our custom from the first to use the blunt Floyd-Robinson needle for first compressions and for refills an ordinary small, sharp pointed luer needle with a glass connecting tip to furnish union between the needle and the rubber tube. We still continue this procedure, probably more at present as a matter of habit than from the fear of puncturing the visceral pleura, which was our original reason for commencing with the blunt needle. It is our opinion, as a result of experience, that in the hands of frequent operators the small sharp needle is as safe as the larger blunt needle of the Floyd-Robinson type. The visceral pleura is undoubtedly punctured scores of times, sometimes knowingly, perhaps many times unwittingly, in first compressions and certainly a small puncture with a sharp small leur needle will seal over much more quickly and surely than the larger wound made by the blunter and larger instrument. The main thing in giving first compressions is not the size nor the make of the needle but the behavior of the fluid in the manometer. An oscillating negative pressure is the determining factor in arriving at a decision as to where the tip of the needle should rest.

There may be many indications for the use of artificial pneumothorax and there is much difference of opinion as to when to advise and when to commence the induction of this procedure, and every operator has his own method of arriving at a decision. Personally, while we are enthusiastic about the use of pneumothorax and while we rather increase than decrease the use of this method, we are still inclined to be very conservative in advising the procedure. Our point of view is about as follows:

Tuberculosis is a very uncertain and deceptive disease. No man, it matters not how wide his experience, can predict with any great degree of certainty after a first examination, and without having time to study his patient, just what will happen to any tuberculous individual; except, of course, in those patients who are very clearly nearing the end of their course. Granting, if you will, that the patient is given the benefit of all the modern methods which constitute the usual dietetic-hygienic regimen, there is one thing that determines more than any other the prognosis of that patient and that one thing is impossible of estimation by means of any instrument of precision. That determining factor is the patient's individual resistance to tuberculous disease.

As some one has expressed it, "it is not the kind of disease which the patient has but the kind of patient who has the disease which counts"; and this is particularly true in tuberculosis. Every one, who has seen and had under long observation many cases of tuberculosis, has seen scores of patients who prove the truth of this remark. Patients with limited disease and a bright outlook and under the best of care may have progressive disease, while others with extensive involvement and poor outlook improve from the start and make good economic recoveries. We have seen many of this latter type both before and since the days of the acceptance of pneumothorax. This is part of the story.

There is another part. Pneumothorax once commenced must be long continued; no man can predict for how long; months at least, years perhaps. The patient in whom artificial pneumothorax is commenced, if the compression is successful, is tied to a physician for an indefinite length of time. He must continue his refills. He must be within visiting distance of some one capable of making these refills. He is no longer a free man.

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* Read before the Annual Meeting of the California Tuberculosis Association, Oakland, Calif., Oct. 22, 1926.

For these reasons we are conservative and, except in cases of emergency, such as severe and continued hemorrhages, it has been and is our practice to delay the induction of artificial pneumothorax until we have been convinced by study and observation of the patient that he will not improve or that his disease will be progressive under ordinary measures of treatment. Once such a decision is reached we do not hesitate to advise compression.

It must be admitted that, when one has waited several months trying to avoid pneumothorax and later is compelled to resort to this procedure, one's conservatism is sorely tried, but we have felt that it is better to delay a few months unnecessarily in a few cases rather than to commence pneumothorax unnecessarily in cases which may progress satisfactorily without operation.

Use of the x-ray. We believe the assistance of the x-ray for photographic films and for fluoroscopic screening to be almost indispensable. It is a custom, from which we never depart, to control our compressions by means of the fluoroscopic screen. By this means one recognizes instantly and clearly the amount of compression, the presence and character of adhesions, the presence or absence of pleural effusion and at the same time can keep the noncompressed lung under observation.

Just a few words as to the types of cases we believe suitable for compression. Briefly they are:

1. Progressive cases as mentioned above. It is our belief, borne out by experience, that it is possible frequently to get good results in cases with not inconsiderable activity in the noncompressed lung, although the ideal cases are those with one lung relatively free from active disease.

2. Stationary cases which have improved under the ordinary regimen, but which have apparently been at a standstill for several months. Here the choice of cases is, in our opinion, more limited and the physician should hesitate before beginning compression, where there is much involvement in the better lung. In the progressive group one has a choice between allowing his patient to progress to death or to offer him the possibility of help from lung compression. In this group no harm can be done the patient, if the lesion in the noncompressed lung is activated by the extra work placed on it. In the second, or stationary group, however, the lighting up of quiesence might change a patient from the stationary to the actively progressive type.

3. Hemorrhage cases. We endeavor to compress all cases of active uncontrollable hemorrhage, especially those cases accompanied by high temperature and with apparently commencing complicating pneumonia.

4. Pleurisy with effusion. Occasionally we have pleuritic effusions occurring in the noncompressed side in cases of pneumothorax. In these cases we do not replace the aspirated fluid by air. Occasionally, also, we have nonpneumothorax patients who develop an effusion on the good side. In these cases we frequently insert 100 c.c. of air in order to change the fluid shadow on the fluoroscopic screen from an oblique line running from above downward and inward, seen in effusions where air is not present, to the level line, seen where fluid and air are both present. This enables us to more correctly estimate the quantity of fluid remaining after aspiration as well as to ascertain the continued formation of fluid in those cases requiring further aspiration. In those cases, where pleural effusion occurs in the more involved lung, it is our practice to replace the aspirated fluid with air and, if circumstances warrant, then to continue the case as one of ordinary pneumothorax.

5. Lung abscess. Our experiences with pneumothorax in cases of lung abscess has been uniformly unsuccessful. Either we have been unable to secure a satisfactory compression because of adhesions or else because of the friability of the lung parenchyma and pleura over the abscess, the lung has ruptured and we have had the serious combination of lung abscess, empyema and bronchial fistula. We employed this method in our first case of this type in March, 1916, several months before the first case reported in the journals. The patient died from exhaustion, due to an empyema following rupture of the lung. There is no type of case we meet where it is more difficult to resist the temptation to use pneumothorax than that of lung abscess because when successful the results are so amazingly good; but for a considerable period of time we have successfully resisted the temptation and have referred such cases to the surgeon.

We have tried double pneumothorax, partial compression of both lungs, in three cases. In the first case it was necessary to desist and decompress because of a nearly fatal pulmonary edema. The second case is still under treatment with sufficient improvement to justify continuing the double compression. The third case, a recent one, had a spontaneous pneumothorax following third compression and succumbed to shock. We believe, however, that in certain cases, where there is a breaking down of the noncompressed lung with only partial compression on the other side, a partial double pneumothorax is worthy of trial, where the patient and his family have had the entire situation thoroughly explained to them and have given their consent.

Dosage. The dosage to be used is important and on this subject there is considerable difference of opinion. We believe the logical method of determination of dosage is to adapt the dose to the patient, and for this reason we have only a few general rules which can be modified as may be necessary in the case of individual patients.

1. In ordinary cases of pneumothorax the initial dose is small, 300 to 350 c.c., bearing in mind that at no first compression must we depart from an oscillating negative pressure. Following the initial dose, we gradually increase the dosage, the increase being an individual matter, depending upon manometer readings, x-ray findings and the symptoms of the patient. Care and experience on the part of the physician, combined with intelligent cooperation on the part of the patient, will usually enable one to estimate the most satisfactory dose for the individual.

2. Where a patient is compressed because of hemorrhage, the initial dose is usually larger than in ordinary cases. Here the initial dose, as given by us, is usually 500 to 600 c.c. We realize that many operators give larger initial doses in hemorrhage cases, but with us our main concern is not the size of the dose but the ability to establish an air-pocket. Once this air-pocket is successfully established, it is very easy to increase the pressure if necessary and by giving only a moderate initial dose we avoid distress to the patient.

3. In pleurisy with effusion patients, where it is decided to establish a hydropneumothorax, we have a more or less elastic rule of injecting 100 c.c. of air for every 200 c.c. of fluid aspirated. For aspiration we use a 100 c.c. luer syringe and inject the air with the same syringe, removing 200 c.c. of fluid and injecting 100 c.c. of air, then removing another 200 c.c. of fluid and injecting another 100 c.c. of air, and so on. As stated above, however, this rule is quite elastic as to quantities and the procedure varies with individual patients.

4. Where air is introduced merely for diagnostic purposes in cases of effusion, and where it is not our intention to continue a pneumothorax, we inject from 100 to 200 c.c. of air which is quite sufficient to change the shadow line when observed by means of the fluoroscopic screen.

Interval. With the question of dosage must necessarily be considered the matter of interval between doses. With interval as with dose, the needs of the individual must be the main factor in any decision. One cannot have any fixed rule as to intervals. We do, however, have two main general rules which we follow.

1. The first few doses following the initial compression are usually given at short intervals about as follows. Let us suppose the initial dose is given on the first day of the month. Other doses in average cases would be given on the 3rd, 7th, 11th, 16th, 23rd and 30th. From this time on the interval will vary with the patient, depending, as stated above, upon the manometer, the fluoroscopic picture and the patient's symptoms.

2. After a patient has a satisfactory or fairly satisfactory compression, we do not enter the pleural cavity oftener than is necessary. Pneumothorax operation is ordinarily a very easy and a very safe procedure, and in an overwhelming number of cases any untoward event or accident will not happen during the early compressions. Nevertheless, we feel that the greatest care should be used in every operation and that no pleural cavity should ever be punctured without a feeling of considerable responsibility. For this reason we incline rather toward the procedure of giving a little larger dose at a little longer interval, rather than to give smaller doses at shorter intervals. It does no harm to repeat that individualization and not the number of c.c.'s given per dose, or the number of days per interval, is the great consideration.

Aside from the economic and allied factors which attend the long period of time pneumothorax refills must be continued, we have not encountered any obstacles or complications which should in any way tend to discourage the use of pneumothorax. We have had no experience with so-called air-embolism; such cases of pleural shock as we have seen have caused no permanent damage to the patient; and, aside from the death just mentioned, which followed spontaneous lung rupture in a case of bilateral pneumothorax, we have seen no death directly due to lung compression. We have had, in common with all operators, complicating serous and purulent effusions develop in the air filled pleural cavities. Our belief, based upon our experience, is that these complications are not necessarily of ill portent. In fact, in the case of serous pleural effusions, we believe their presence is frequently beneficial to the patient.

Our belief regarding the various types of effusions can be briefly stated as follows:

1. We think that simple pleural effusions are more often beneficial than otherwise. When the fluid is not productive of acute symptoms, such as high fever and other signs of toxemia, we do not remove it but allow its accumulation because the fluid splints the lung as effectively as does air. In addition it seems to us that there are at times other very distinct benefits from the presence of fluid and that some patients improve more rapidly and more markedly after the formation of fluid than previous to its appearance, almost as though they absorb from their fluid some antibody-stimulating substances. For these reasons we do not disturb what we speak of as "good fluid," unless mechanical symptoms arise due to pressure on the good lung or because of cardiac embarrassment or because of the great weight on the diaphragm.

When, on the other hand, the appearance of serous effusion is characterized by marked toxemia, we invariably aspirate and reaspirate until the symptoms disappear and we have the so-called "good fluid."

2. When we have a tubercle bacillus empyema appear during the treatment, it is our custom to disturb it only in case it causes toxic or mechanical symptoms.

3. The occurrence of an acute pyogenic empyema is a very alarming complication, and our experience with it has been almost universally discouraging in spite of aspiration, pleural lavage and other recognized methods of treatment. This acute type of empyema has, in our experience, been seen only in spontaneous pneumothorax, due to lung rupture following artificial pneumothorax. Aside from the danger of acute empyema, spontaneous pneumothorax occurring as a complication of artificial pneumothorax has not been productive of permanent serious results. In fact, where an acute empyema does not supervene, spontaneous lung compression often aids both the patient and the operator by allowing, through separation of previously resistant adhesions, a better and more efficient lung compression.

Finally a few words as to our belief regarding the efficacy of pneumothorax. What does our experience teach us regarding the results that may be expected from this measure? We believe as follows:

1. Artificial pneumothorax is of the very greatest value in the treatment of advanced progressive types of pulmonary tuberculosis, where the patient fails to respond to ordinary measures. Its use is not necessarily restricted to cases which are largely unilateral. Our belief is based upon numerous cases of patients who are today well and working, who otherwise would, so far as it is humanly possible to judge, have continued progressively to death. It is strengthened by the fact that numerous patients, who have not secured an arrestment of their disease, have attained great relief due to lessening of toxemia, with reduction or disappearance of fever, have experienced great reduction in cough and expectoration, have had relief from pleuritic pains, have had reduction or disappearance of laryngeal symptoms and have had restored to them a greater felling of well being and a happier outlook. And these things, cure in some cases, relief in others, have occurred in patients otherwise apparently doomed.

2. A complete compression is not necessary to obtain these results. As a matter of fact, only a small percentage of our cases, because of the type selected, secure complete compressions. Even a very small compression in some fortunate cases seems to be the determining factor in tipping the scales in favor of the patient. We had one patient who, after being in bed more than a year because of fever, obtained a normal temperature shortly after compression was started and eventually became completely well, in spite of the fact that we were able to get only a partial compression of the lower part of the lung and never injected more than 250 c.c. at any one operation. This man has now been working several years and has been and is symptom-free. We have seen similar cases but none so striking.

3. Pneumothorax is the one great positive thing we can turn to in cases of uncontrollable hemorrhages. With such a complication the results are exceedingly striking and we have seen many patients of this type, where pneumothorax has prevented what was apparently impending death. Since we have been using pneumothorax for the control of hemorrhage, we have practically banished from our institution what had been to us the most dreaded follower of hemorrhage, pneumonia with its high percentage of fatal cases.

4. We firmly believe that the remedy can do the patient no harm if properly applied. In saying this we are not unmindful of the occasional fatality which occurs. But where the selection is made as we make it from progressively declining patients, the statement holds.

HAYFEVER

RESULTS OF TREATMENT WITH POLLEN EXTRACTS *

ROBERT F. E. STIER, M. D.
AND
GUY L. HOLLISTER
SPOKANE, WASH.

The misnomer, hayfever, has been applied to all conditions of the respiratory tract, producing symptoms of sneezing, coughing, excessive lacrimation and nasal hydrorrhea. The causes of these conditions are numerous but here will be considered only those having the pollens as their causative agents.

As early as 1673 this syndrome was described as a clinical entity by Beningerus. In the early 19th century the English school did work which has paved the way to the present knowledge of this uncomfortable disease. As many causes were advanced as there were investigators. Such things as sunlight, heat, ozone, emanations from hay, flowering plants and decaying vegetable matter, were supposed to be the causes of this seasonal disorder. In 1833, Elliotson first suggested, but was unable to support his views, that the condition was due to the flower of the grass and probably it was the pollen of this grass. In 1865 Blackley, who was a hayfever subject, applied the pollen of lolium italicum to scratch marks of the forearm and obtained a typical urticarial wheal. In America, Wyman, in 1870, showed that the American or autumnal hayfever was dependent upon the flowering of Roman wormwood (ambrosia). During September of that year he sent ambrosia in full bloom to a resort in the White Mountains. This weed was sniffed by eight hayfever patients. One developed asthma, six had varying symptoms of catarrh and one was unaffected. Eight other patients who did not come in contact with the package remained symptom-free.

In 1902, Dunbar, a German, accepted the pollen theory and demonstrated that hayfever was caused by the protein constituent of the pollen grains. He produced hayfever symptoms by instilling a pollen extract into the conjunctival sac of susceptible individuals. In 1911 Noon and Freeman obtained positive skin reactions in susceptible individuals with the grass pollens which grew in England. In 1913 Clowes carried out similar reactions in this country with the autumnal type of hayfever, proving that ragwood was the active agent. In 1914 Koessler proved the specificity of pollens in the causation of hayfever. He found that the so-called June cold was due to the family gramineae, while patients who suffered from autumnal catarrh belonged to the large family of compositae. Since this time the advances have been very rapid. These consisted of developing effective methods of desensitization and preparation of potent and stable pollen extracts.

As a result we are now working with potent solutions with which excellent results can be obtained. The centre of the stage of investigation is occupied by an endeavor to determine the underlying cause of this disease, i. e., the reason that only about 1 per cent of the population develop the disease under equal conditions. Still another phase of investigation seems to be to determine the active agent of the pollen which produces the disease. The tendency is to discredit the theory that the protein is the active cause, as it has been demonstrated that hayfever can be relieved by treating with a pollen extract from which the protein has been removed. Thus everything in the cause and treatment of hayfever has not been told, but we feel that investigations have advanced to such an extent that excellent results can be obtained in the treatment of this malady.

Before one can undertake intelligently to diagnose and treat hayfever, he must have a sound botanical knowledge of the region in which the hayfever to be treated occurs. To obtain this information it is necessary to make a complete botanical survey, noting in detail all wind-pollinated plants. Such general surveys have been made in the states of Washington, Oregon, Idaho, Montana, Utah and Colorado, by our botanist, Professor T. A. Bonser of Spokane.

Pollens from the most important hayfever plants in this territory have been collected. This was done by picking the flowering heads just at the beginning of pollination. These pollinating heads were placed in receptacles, containing a nutrient solution and placed in a specially constructed, air-tight room, where they were allowed to finish pollinating in practically their own state. The matured pollens are allowed to fall on glazed paper. They are then purified, dehydrated and placed in ampoules that are sealed and not opened until used to make pollen extracts. The pollen is extracted in a solvent of glycerin and salt solution for seven days. After this it is sterilized by passing through Berkfeld filter. For treating hayfever the extracts are measured out in small doses. Ordinarily the first dose contains one pollen unit, which was defined by Noon as being one-millionth of a gram of pollen. The dosage is gradually increased until 1,000 or more units can be given in a single dose.

Individual graduated doses are provided, to be diluted with sterile distilled water immediately before they are administered. The doses are repeated every day for the first ten or twelve doses; after this the interval between doses can be extended to two or three days. The treatment period is planned so that the course of treatment, consisting of twenty or more doses, is completed at about the time the weed, to which the patient is sensitive, starts to pollinate.

Our experience during the season of 1924 demonstrated that, when treating with a pollen, whose pollination season lasts for a longer period than four to six weeks, additional weekly or biweekly doses had to be administered during the hayfever season. The experience of other workers, as well as our own, has proven that in the majority of cases the maximum immunity is retained for a period of from four to six weeks after treatment has been discontinued. Each case, however, is individual and requires constant supervision and checking. Dosages outlined for one patient may be insufficient for another. Preseasonal treatment is the method of choice whenever possible, but seasonal desensitization should be attempted in those cases that seek relief after symptoms have developed, as a good percentage are given partial if not complete relief. Each season gives us added knowledge of the common pollen offenders of each vicinity and because of this accumulated experience the results for each succeeding year are better.

The group of cases making up this report are largely from the Inland Empire. A limited number of cases only can be reported from the Coast district. All ages are represented and our observations coincide with those of Piness of Los Angeles that all ages of the first four decades of life are almost equally liable, although the first decade is most liable.

There are approximately three seasons in the Inland Empire, one group commencing in March and April, in which the trees are the causative factors. The second group commences in May and June, in which the grasses are causative factors. The third group appears in July and August, in which the Russian thistle, sagebrushes and poverty weeds are the chief causative factors, this group being responsible for about 60 per cent of all the hayfever in the Inland Empire. Along the Coast there are but two seasons, consisting of an early or tree season, which is short, and a grass season, which commences early in May and lasts through until heavy frost.

Treatment was furnished to approximately 1,000 patients during the years of 1923, 1924 and 1925. At the close of each hayfever season a questionnaire was mailed to the patients receiving treatment. In this questionnaire we asked the patient to estimate the relief obtained during that season. They were asked to check one of the following:

1. I had complete relief from hayfever symptoms.
2. I was practically free from hayfever symptoms.
3. I was 75 per cent relieved.
4. I was 50 per cent relieved.
5. I was 25 per cent relieved.
6. I had no relief from hayfever symptoms.

Each of these patients had been previously tested with our diagnostic extracts to determine the degree of sensitization and a record of these tests was on file. Of these, the total number to answer such a questionnaire was 735, upon which this report is based. An attempt has been made to draw certain conclusions from this series of cases.

It is interesting to note that one case developed symptoms as early as February. Following is a summary of the frequency of the onset of this series of cases:

March	13 Cases or	1.8 per cent
April	46 Cases or	6.3 per cent
May	125 Cases or	17.0 per cent
June	159 Cases or	21.6 per cent
July	378 Cases or	51.5 per cent
August	13 Cases or	1.8 per cent

Therefore, over one-half of the hayfever cases we see in the Inland Empire develop symptoms in July.

No attempt can be made in this paper to correlate the results of treatment with the various pollen extracts, but in a general way some deductions can be made when we consider the month during which symptoms usually commence. Patients treated preseasonally and coseasonally are included in this analysis:

February	1 case	Complete relief	
March	13 cases	Complete relief	8 per cent
		Practically free	54 per cent
		75 per cent relief	7 per cent
		50 per cent relief	31 per cent
April	46 cases	Complete relief	15 per cent
		Practically free	44 per cent
		75 per cent relief	17 per cent
		50 per cent relief	15 per cent
		No relief	9 per cent
May	125 cases	Complete relief	18 per cent
		Practically free	45 per cent
		75 per cent relief	22 per cent
		50 per cent relief	9 per cent
		No relief	6 per cent

June	159 cases	Complete relief	9 per cent
		Practically free	35 per cent
		75 per cent relief	31 per cent
		50 per cent relief	17 per cent
		No relief	8 per cent
July	378 cases	Complete relief	11 per cent
		Practically free	31 per cent
		75 per cent relief	26 per cent
		50 per cent relief	20 per cent
		No relief	12 per cent
August	13 cases	Complete relief	23 per cent
		Practically free	23 per cent
		75 per cent relief	38 per cent
		50 per cent relief	16 per cent

Grouping these cases according to seasons we find that those caused by the trees (February and March) obtain complete relief from their symptoms. In the second group, those caused by the grasses occurring during April, May and June, 91 to 94 per cent obtain a satisfactory relief. In the third group are placed patients in whom symptoms commence during July and August. The offending pollens are principally Russian thistle and the sagebrushes. In this group 88 per cent of the patients treated obtain satisfactory results.

A consideration of all cases without regard of the time that symptoms commence, is as follows:

Complete relief	12 per cent
Practically free	35 per cent
75 per cent relieved	25 per cent
50 per cent relieved	17 per cent
25 per cent relieved	2 per cent
No relief	9 per cent
Total satisfactory results	89 per cent
Total unsatisfactory results	11 per cent

A question that the patient usually asks is: How permanent are the results? Our present knowledge is still insufficient to answer this question fully. One can truthfully say that an immunity is established, but it is not complete. It will take many years to establish reliable information along this line, but a check of our cases where treatment has been given two seasons, shows 45 per cent have had the same satisfactory results for the two years, while 46 per cent showed improvement either from "no relief" one year to a satisfactory result the next year or some intermediate degree of improvement. Only 4 per cent had a good result one year and a poor result the second year, while 5 per cent showed a consistently poor result for both years.

Complete records are only available in fifteen cases that were treated three consecutive years. Ten of these cases showed varying degrees of progressive improvement. Four cases were unsatisfactory for the three-year period. One case had an unsatisfactory result the first year, a good result the second and an unsatisfactory result the third year.

What degree of immunity can be established by one year of treatment? The following data are available to answer this question.

Out of a total of 64 returns from questionnaires sent to patients receiving treatment in 1924, but not in 1925, 55 or 84 per cent developed hayfever; 9 or 16 per cent remained symptom-free. Of these nine, three moved to another locality, leaving six in the same locality and under the same pollen conditions during both seasons. All of these patients had received 75 per cent relief or better the previous year.

In the 55 cases who developed hayfever, the symptoms developed at the usual time in 71 per cent; later in 24 per cent and earlier in 5 per cent. As to severity of the symptoms compared with previous years, they were milder in 58 per cent, the same in 29 per cent and worse in 13 per cent. Thus, it is reasonable to say that patients who receive treatment for one year only will undoubtedly develop symptoms the succeeding year, but they are apt to be milder than previous years, providing good results were obtained during the season of desensitization.

It is unreasonable to expect to obtain 100 per cent of relief in hayfever. Each individual must be analyzed, as a uniform dosage cannot be established. Thus, a doctor must have an interest in his hayfever cases, if satisfactory results can be hoped for. The patient (and doctor at times) requires education. First of all, they must be taught to report for preseasonal treatment because most satisfactory results are obtained in such individuals.

Other factors which influence the results are:

1. Poor cooperation between doctor and patient. Falure to follow his better judgment regarding treatments outlined and additional doses.
2. Failure to completely test patients to obtain all the possible factors.
3. Improper interpretation of skin reactions.
4. Omitting in the treatment a member of a botanical group which is an important factor in that locality.
5. Incomplete surveys and lack of knowledge of pollination seasons of hayfever plants in a locality.
6. Use of potent extracts for both testing and treating.
7. Sensitization to additional pollens during the hayfever season.
8. Treatment with pollen extracts of conditions resembling hayfever and coexistent with the hayfever season, yet not due to pollen irritation, such as orris moot sensitization.

SUMMARY

An anaylsis of treatment supplied over a period is presented. Hayfever commences more often during the month of July than any other month. A greater proportion of satisfactory results are obtained in those developing symptoms during the grass pollination season than during the Russian thistle pollination season. A summary of all cases shows a total of 89 per cent of satisfactory results.

An analysis of treatment supplied over a period of years is limited. However, it can be concluded that, if results are unsatisfactory the first year, enough data should be available for study of that case so that in the succeeding years a better result can be expected in most of the individuals. Only about 5 per cent showed consistently poor results in the two-year cases.

Cases receiving treatment only one year can expect to develop symptoms during the following season, but these are usually modified.

Suggestions are presented for the cause of unsatisfactory results.

Cohabitation, Colon Bacillary, Urinary Tract Infection. Two cases of cohabitation colon bacillus infection of the upper urinary tract are reported by A. J. Scholl, Los Angeles (Journal A. M. A., Nov. 27, 1926). The first case, at the onset, was almost fatal and markedly resistant to all types of treatment; in the second, the infection was of short duration with mild symptoms, and it responded to simple treatment. The infection in both these cases occurred in women to whom coitus caused trauma and was painful. In the pathogenesis of ascending urinary infections following coitus, traumatism plays a very important role. It predisposes to infection, and the colon bacillus is the most frequent invader. The infection may be light, transient and unrecognized, or it may cause all the symptoms usually observed with a severe urinary infection. The colon bacillus probably enters the tract either through small wounds in the ruptured hymen or through the urethra, which may have been traumatized. The most probable mode of extension to the kidney is by the blood stream or by ureteral regurgitation. Once established, postnuptial pyelonephritis of this type assumes the properties of chronicity and resistance to treatment usually observed in the more common types of pyelonephritis. A cohabitation urinary, colon bacillus infection, similar to urinary infections developing from other sources, may disappear without medication or other treatment. At times the infection persists despite extensive treatment. In the majority of cases, the ingestion of a proper amount of a urinary antiseptic may be sufficient to control the patient's symptoms, particularly when the infection is mainly in the lower urinary tract. In some cases, even when an extensive infection is present, the one insertion of diagnostic, ureteral catheters and pelvic lavage with a urinary antiseptic gives relief. When the infection has persisted for some time, treatment must be instituted similar to that employed in cases of subacute, or chronic pyelonephritis, arising from any cause. When there is retention in the renal pelvis, no matter how slight, the benefit from ureteral drainage is marked.

A NEW RETRACTOR FOR POSTPARTUM REPAIR*

Inslee Blair Greene, M.D.
SEATTLE, WASH.

In presenting a new instrument for use in the immediate repair of high lacerations of the birth canal, it is worth while to recall that our own grandparents were the first to receive the blessing of chloroform and antiseptics. For from the beginning of time until about 1850, the only drugs known for the relief of pain were opium and chloral, and all suffering had to be relieved by them. The year 1850 saw puerperal fever conquered, antisepsis understood, chloroform in general use, and open season for forceps.

Think of the conditions and obstructions under which obstetricians labored seventy-five years ago because of religious teachings, excessive modesty, secrecy, lack of light and equipment. The obstetrician delivered the mother at home, under the covers, by the aid of candles or oil lamps, everything being done by touch unless instruments were used or a laceration was discovered; and at that time few men could recognize any but severe tears.

We all have heard snatches of stories from that period of great feats of strength; for example, of two doctors putting on forceps and their combined efforts finally effecting delivery by brute force. Think of the poor mother! Is it any wonder that she had a vesicovaginal fistula, or a complete tear well up into the rectum with incontinence, complete prolapsus of the uterus, and a thousand and one ailments, if she survived? Truly our grandmothers went down into the valley of the shadow of death for each babe, and the prayer "for women in the perils of childbirth" deserved its place in the church ritual. After a few years of this abuse of forceps came some sanity, and indications and directions for the application of forceps were worked out by a few who were especially expert, while the general practitioner had learned from bitter experience to avoid them if possible.

To meet this pitiable condition of mothers that was so prevalent, Marion Sims in America and Gustav Simon in Germany began their studies on vesicovaginal fistula following labor. Then came work on the ruptured perineum and its successful treatment by Sims, Emmet, Thomas and other surgeons. These men are the pioneer gynecologists, called into existence because of poor obstetrics. As a result of their studies and work, obstetric practice began to improve about 1880. But remember that it was anesthesia which made all their work possible, and it is doubtful if any perineal suturing of importance was done before the anesthesia era, although some work had been done on vesicovaginal fistula.

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* Read before The Seattle Academy of Surgery, Seattle, Wash., Jan. 16, 1926.

Even today lack of surgical skill prevents the general practitioner from repairing injuries to the cervix and upper genital tract at the time of delivery, while pelvic floor injuries involving the levators ani are also poorly handled by him as a rule. After a careful study of many cases, I have reached the following conclusions: (1) Seventy per cent of all mothers should have the lacerated cervix repaired at the time of delivery. (2) Sixty per cent of all gynecologic lesions are the direct result of poor obstetric practice. (3) Eighty to ninety per cent of all parturient women should have repairs. (4) In view of these facts the mechanics of cervical and high vaginal lacerations deserve careful consideration.

As labor sets in, the normally soft, elastic cervix gradually becomes obliterated, then the edge becomes quite thin and the os gradually enlarges. With the pains increasing in frequency and severity, it must stretch more and more rapidly. When the os is three-quarters obliterated, the edge is quite thin and the pressure caused by a pain is great. Now if contractions are too severe or too frequent, the os cannot stretch fast enough. A hard pain, aided perhaps by the nurse urging the mother to bear down, unduly forcing the head, will cause a laceration of the cervix. This laceration may be small or it may be large enough to tear through the cervical artery and even extend into the vaginal wall. If the expulsive force is severe enough, there is not only a bilateral tear, but the anterior or posterior lip may be torn almost off. Dry labor and forceps improperly applied are two very fertile causes of severe laceration of the cervix. These lacerations are constantly occurring, but are generally overlooked unless severe hemorrhage compels the obstetrician to search for them.

The high lacerations of the sheath of the birth canal, not connected with a lacerated cervix, are anterior or posterior to and quite near the cervix. These occur as transverse breaks of fascial sheath, and are most apt to occur in dry labor or forceps with an insufficiently dilated birth canal. These breaks are caused by the head or shoulders being forced too fast down the undilated canal. The drag is too much for the fascia. Clark, during his lectures before the University of Washington Extension Course in 1925, showed some excellent slides of these tears, but gave the impression that they were longitudinal splits and were to be repaired as such. Watkins, however, has made a careful study of these tears and his articles are convincing. He shows that many of them are transverse. If not repaired, they will eventuate in true hernia and may cause endless trouble. This probably explains why so many perineorrhaphies for cystocele and rectocele are unsuccessful, even though the perineal muscles are placed in good position; also why some women with quite badly lacerated muscles have so few symptoms.

In practically every case of labor in a primipara with a child of normal size the vaginal sheath is overstretched, the fascia separated, and the muscles frayed, torn or paralyzed from overstretching. Williams states that sixty to seventy per cent of all primiparae have lacerations of the perineum. Add to these the cases where the mucosa is not torn, but submucous separation occurs or muscle fibers are lacerated or overstretched, and we shall find ninety per cent of all primiparae needing suturing of the perineal muscle.

Twenty-five years ago, or even fifteen years ago, the chief elective operation was the general perineal repair with suspension. Now this operation is comparatively rare, while repairs of vesicovaginal fistula and complete tears are almost unknown. This improvement is due to better trained men, working under better conditions, with better instruments. With the patient in a hospital and with everything convenient, the obstetrician does not hesitate to repair a definitely lacerated perineum. The repairs made by a general practitioner are not always ideal, and he entirely overlooks, or rather does not look for, those injuries that occur high up. Yet these lacerations are the cause of a whole series of evils too familiar to mention.

Several years ago I recognized the relation between these lacerations and the disabilities of women who had born children and I began to suture almost every parturient mother in a rather unusual manner. The results have been so satisfactory that now, if I do not suture and support the relaxed parturient perineum, I feel that I have been neglectful of the trust placed in me by my patient.

My method of suturing has been a gradual development until now I suture practically the whole tract. If possible I have a trained anesthestist in-

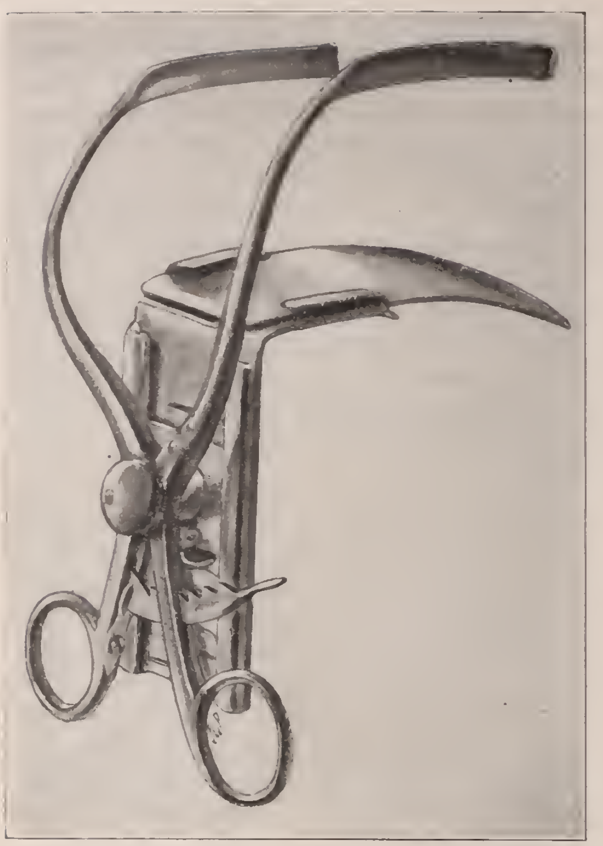

Fig. 1. Combination Retractor and Speculum, author's design. Adjustable broad flat retractor taking the place of the grooved vaginal portion of the weighted speculum, with but little curve. A pair of lateral retractors, adjustable both in their spread and the height they may be raised above the broad retractor; and capable of being locked in any position. Instrument separates into four main parts for cleaning.

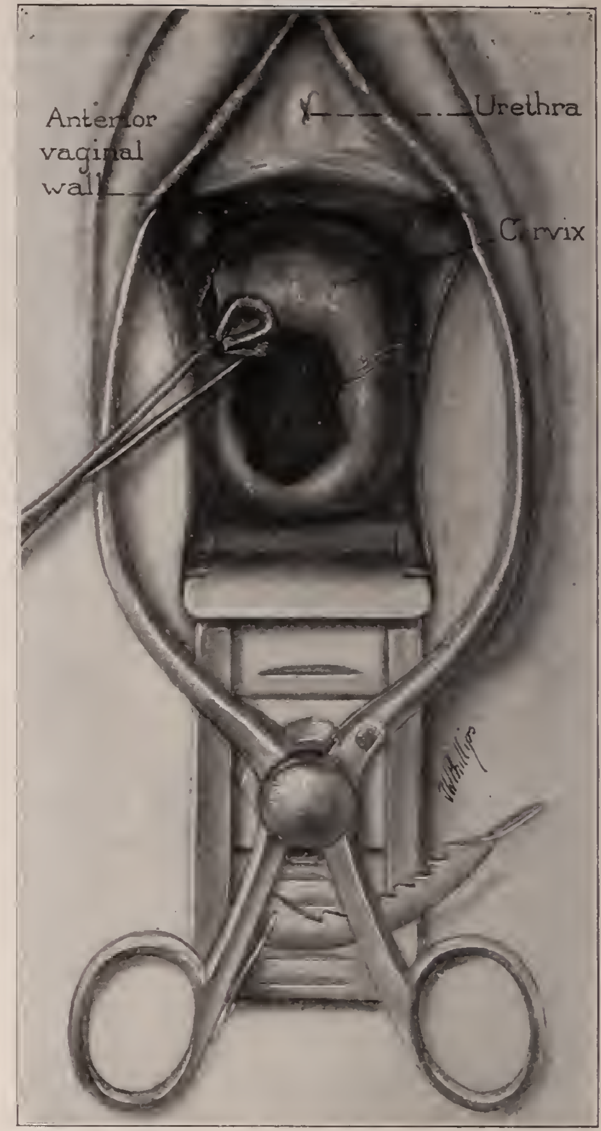

Fig. 2. Speculum in situ, showing view which it gives of the parturient cervix. One tear sutured.

stead of a nurse. For this requires complete anesthesia, and may take some time. My routine is as follows: Immediately on delivery the patient receives ½ to 1 c.c. of pituitrin; on delivery of the placenta, an ampule of ergot. There is then practically no bleeding. She is brought down to the end of the bed and her legs put up in stirrups. The field is then thoroughly cleansed. A special retractor is placed in position, giving a view of the cervix which is examined minutely as it lies in situ. If there is a cervical laceration, this is repaired with buried mattress sutures, not too tightly tied, nor placed too closely together. This type of suture causes the least trauma and brings the edges together perfectly. Any tears high up in the vagina are now investigated and appropriately sutured. The longitudinal tears are sutured longitudinally, the transverse tears, transversely, especial care being taken to bring the fascial edges together. For tears lower down in the birth canal I am using a suture devised by Tilles. I have used other sutures for this purpose but have found no other so effective. This suture is a mattress supporting suture which can best be understood by studying the accompanying illustration. It acts as a sling for the distended lacerated fascia and muscles of the vaginal canal. It is placed before the tear is sutured, as one would place silkworm supporting sutures in an abdominal wound, and is tied afterwards. These sutures bring the vagina back to its normal size and position.

If the mucosa is torn, the perineal muscles are picked up and sutured with deep buried sutures, and the mucosa brought back to its normal relations. But since many lacerations do not show on the surface, the vagina is carefully palpated with the finger in search of hidden tears. Any pockets or culdesacs are closed, and when the repair is complete, the vaginal orifice is in the original position well up

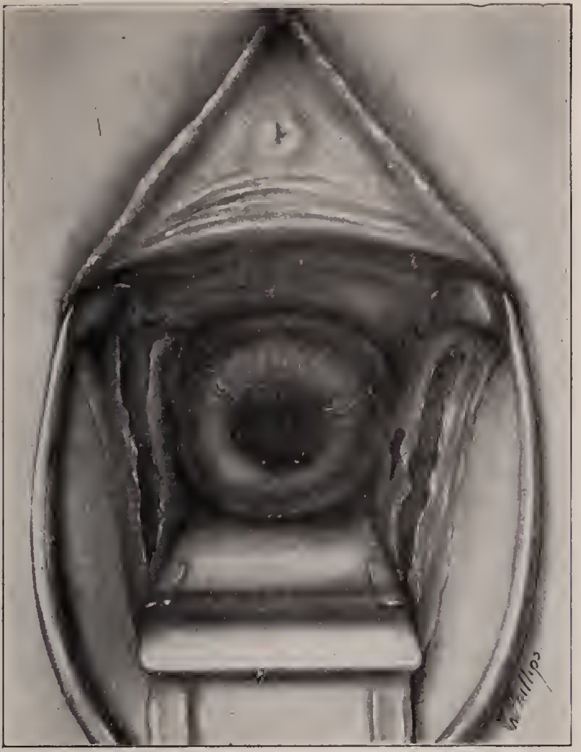

Fig. 3. Cervical tears sutured. Vaginal tears adequately exposed.

under the pubis, and will just admit two fingers, while the perineal body is as large or larger than before parturition, and palpation confirms the fact that it has plenty of depth and its usual shape.

Finally, as an added support, I use two or three silkworm sutures, as recommended by Williams. These are applied with a large cutting needle, deep and wide, and are simply stay sutures to relieve tension on those already placed.

In the case of a multipara, I study her lesions before labor sets in and endeavor to have them clearly in mind. After delivery I do not hesitate to cut out scar tissue in the cervix and repair it in the same way as in a primipara. I also make a general perineal repair and thus leave my patient in practically the same condition as just described for a primipara.

The chief difficulty in doing this work has been to get an adequate exposure. For two or three years I have schemed and studied, realizing that if the present day obstetrician had at his command some instrument that wes self-retaining and which would give ample exposure to all surfaces of the birth canal without distortion, he would then be able with but little trouble to really examine and properly repair any of the lacerations described above.

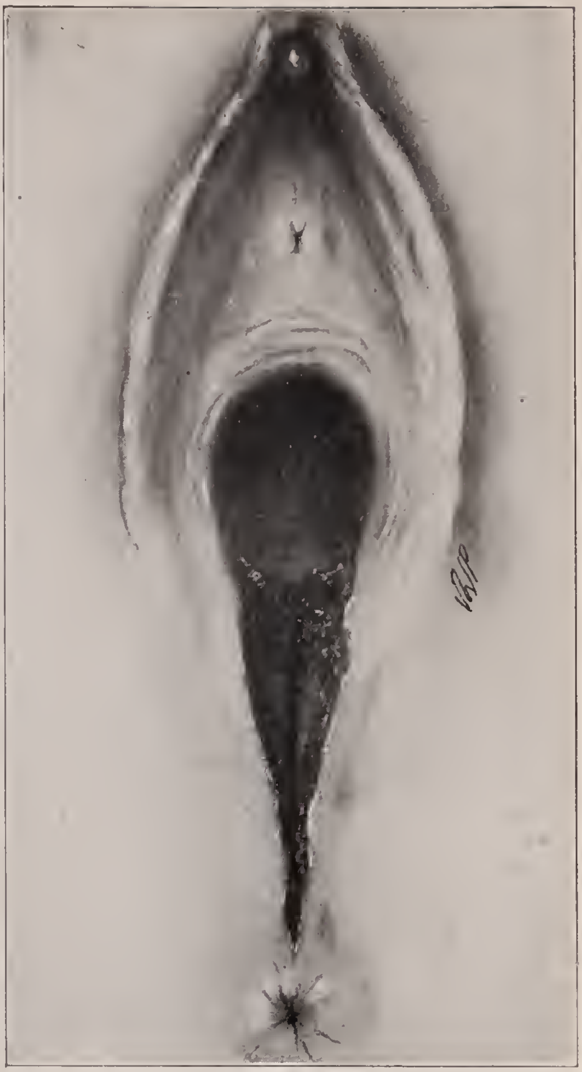

Fig. 4. Instrument removed for final stage, external repair.

Such an instrument should be capable of distending the birth canal to about the size of the head of the child which has just passed through it. It should cover the anus and so remove this source of contamination. It must not obstruct the view of any part, or place undue tension on the already damaged muscles or contused mucosa. It should expose the greatly stretched cervix as it lies in its natural position, thus avoiding any possible damage to the uterosacral ligaments. It should have practically no perineal curve; it should be light in weight, simple, easily and quickly applied; and must give plenty of room for any surgical procedure.

The instrument show in the accompanying illustration is simple, does not get out of order easily, is light in weight, of strong construction, has no protruding parts to catch on gauze or sutures, and is positive in its action. It is self-retaining, thus elim-

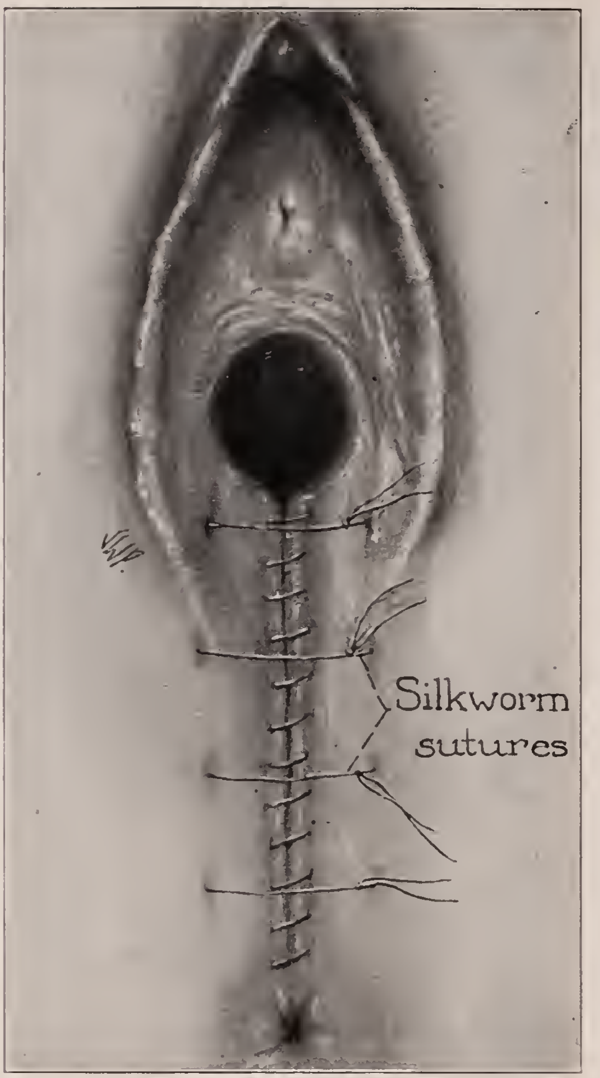

Fig. 5. External repair complete. Note restored perineal body and position of vaginal orifice.

inating the unsteady assistant, holding a wobbly, makeshift retractor, which must be constantly adjusted to obtain a moderately satisfactory view. The broad, flat, external portion acts effectively as a cover for the anus and can so remain until practically all sutures are in place.

With the retractor in place and the lateral blades opened to the desired width, the broad sliding blade can be easily adjusted so as to permit the most minute searching examination of every portion of the birth canal. All parts are seen in their normal relations: the cervix is in situ and is easily and clearly soon as the open end of a flabby bag. With a pair of long sponge forceps the lips of this bag can be completely traced, and any necessary suturing done. If for any reason the view is not quite clear, a flat flexible retractor is inserted and the vesicovaginal wall near the cervix lifted.

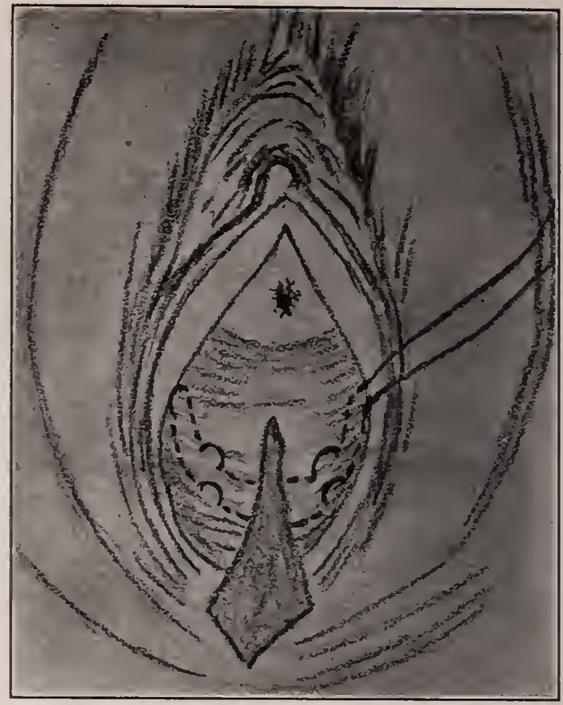

Fig. 6. Tilles' mattress suture.

Breaks and lacerations of any part of the birth canal are easily seen in their entirety. The finger can search for any submucous breaks.

In the opening given by this instrument, the application of sutures is easily and quickly accomplished. When the suturing of the cervix and vaginal walls is completed, the instrument is withdrawn and the perineum repaired.

I present this instrument in the hope that others may find it the means by which they can do this necessary work with minimum difficulty and maximum efficiency.

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460 Empire Building.

THE ASPECT OF MEDICINE FROM THE STANDPOINT OF SCIENCE AND THE LAYMAN *

J. R. E. Sievers, M.D., F.A.C.S.
BUTTE, MONT.

Our great medical profession must realize, comparing the past and the present, especially those that have served their last twenty-five to thirty-five years or more in the service of humanity, that progressive headway in commerce, general arts and all sciences, and above all what concerns us, particularly in our medical art, have been most admirable and astounding. It has affected the entire civilized world, shifting and rearranging its various phases in every department, economically and socially in relation to the betterment of readjustment of our modern times. Do not most physicians realize that with modernization of thought, a thinking student must feel himself conscious of the fact that with the progress of our times from year to year his effort at correct diagnosis in sickness is becoming a greater and more growing problem of personal responsibility than ever before?

Scientific thought is gaining foothold in every direction and growing speedily and voluptuously like a mushroom overnight, so that no man or genius can cope with its conception in this particular any longer. To make his career a success one is duty-bound to practice loyalty to his highest call, by remaining an everlasting friend to his studies from the day of his initiation in college as a student, remembering that only through continuance of diligent work in theory, clinical and laboratory work can he pas an expected examination with a fair average to his credit, confronting the newly accepted and modified theories now at his disposal.

The individual, general practitioner, is called upon in his association with the layman to give evidence of the presentation of his theory and practical knowledge, to declare his platform of principles he stands for, in making a satisfactory explanation of his conclusions. Are we confident of our wisdom? Do we dare confess the truth? It may be best to keep silent, for silence may mean our wisdom.

It is true, a fool may ask more questions than a wise man can answer. Does the doctor realize, in analyzing himself, that a wise man, more than any other, knows that he does not know what he knows?

P. K., in his great work addressed to the progressive intelligence of the age, says as to classification of data in knowledge: "Some things we know and we know we know them. Some things we assume to know, but we know that we do not know them. Some things we believe, but we do not know them nor do we even assume to know them. All other things we neither know nor do we even believe them."

Everlastingly the practitioner of former days, who called himself the closest, dearest and nearest friend of the family in health and disease, is vanishing in identity, departing from his ancient dignified position more and more. The sense of faith, respect and esteem the general layman used to show the regular graduate M.D. of the old school, calling him politely doctor, meaning scientist, has almost ceased, since the public, without objection or resistance, deeded and donated its title of "doctor" to every faker as well, not recognizing or appreciating the significance of its intended meaning whatsoever.

We allow ourselves to be called "Doc." Change its last letter from "c" to "g" and we are back again in a retrospective of anthropogeny to the "classa animalia." A chiropodist, chiropractic, osteopath, christian scientist practitioner, applied psychologist practitioner, Chinaman of commerce or not commerce, every supposed healer, is named on the street "Doc" here, "Doc" there, by the laity. We regular M.D.'s all have become helpless and docile and now accept it as a matter of slang, without comment or objectional resentment.

What could have caused such disgrace to our heretofore looked-up-to, high titled profession? I must say it is the psychologic influence of the progress of the times but with a retroactive taste for greater immorality.

As research and investigations have progressed, the medical profession is acknowledging, *nolens volens,* in evidence of its necessary unavoidable development and expansion, its own present weakness, in drifting apart into segregated specialties, although appreciating their necessity and benefit, losing with individual separation the identity of personal equation, giving an inferior complex to our newly arrived at situation of greater and more expansive group medicine.

The grand old medical doctor of distinguished dress, carriage and dignified appearance moved mostly in selected company amongst the best educated of people known in social circles. He was looked upon as of learned, high-minded principles. The present-day appearance of our M.D. has yielded to suit general democracy in our costumes to the degree that it is hard to tell if we are MD.'s or commercial men. Most likely our conduct, actions and transactions of free, more liberal association and intermingling with the multiple humdrum of masses at large led to circumstances which brought the changes and consequences.

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* Read before the Forty-eighth Annual Meeting of Medical Association of Montana, Billings, Mont., July 16-17, 1926.

Before the sixteenth century with the discovery of Harvey, who explained first in detail our circulatory system and his "omne animal ex evo" theory, the commencing realization of the necessity of awakening from the sleeping mind out of its darkest dreams to a meaning and appreciation of the physical laws of our objective world, the aspect of medicine, from its standpoint of science, took its gradual issue.

Illiteracy of the human being conformed mostly to the suggestion of abstract mythologic belief and religious dogmas. Though Hippocrates, Galen and the greatest Greek natural philosopher that ever lived, Aristotle, and others gave evidences of the conception of their most brilliant ideas, relatively slight progress was made in the general dissemination of knowledge and information for want of general interest and the circumstances of commercial disadvantages, in distributing intelligent information by print, modern railway connection, navigation, telephone or telegraphic communication. Great scholars and students of anatomy, in search of the material truth of nature, arose in the sixteenth century simultaneously with Harvey, namely: Vesalius, Eustachius, Fallopius, Servetus, and many others.

It is considered in general that the middle of the nineteenth century gave the greatest of all stimulus to further developments of the expression of real intellectual, creative thought and its practical application, revolutionizing not alone medical science but all civilization, socially, economically, politically. It crystalized to unexpected reality with the epoch-making announcement of Charles Darwin's conception of the origin of species and the anthropologic order of the evolution of plant, animal and man, and the latter's position in the material universe, the "homo sapiens" of the nineteenth century, giving us the first materialistic, plausible comprehension of nature's wonderful evolutional development.

This appealing, sane and sound doctrine, based on biologic studies, connecting link by link its validity in a logical, methodical classification, was supported by noted scientists, as Darwin, Spencer, Tyndall, and the great friend and admirer of Darwin, the distinguished German master mind and naturalist, Ernst Haeckel. The latter, as defender of the law of substance and his monistic philosophy, aided its principle of teachings to greatest benefit and realization and practical accomplishments, that are claimed by scientists to have led to unexpected inventions and discoveries to this very day.

Of recent years our ancient, speculative philosophy has changed in its aspect to pragmatism (James). It advocates conclusions by laboratory investigations from the viewpoint of combined experimental physiology and psychology.

An explanation of the psychologic behavior of our personality in its presentation in health and disease has become one of our greatest scientific problems of utmost importance. To swear at our patient is today considered unscientific and an evidence of ignorance of the attending physician. We now know that every cause has its effect. Crile and Cannon, supported by many others, emphasize and prove that agreeable impressions, "bene association stimuli," give favorable response for upbuilding processes of our nervous systems, and internal viscera affecting the endocrine organs more in particular. Disagreeable, painful stimuli, or pessimistic introspective thought (fear, worry) give the opposite "noci" reactions. George Crile, one of our leaders, and all of us today, make use of more or less suggestive therapeutics and of local anesthesia, in practical application of this very theory, admitting such truth.

As a great aid in diagnosis, anyone who loves to deal with the psychology of human nature and its riddles pertaining to human behavior in life should read Louis Berman's late work, "The Glands Regulating Personality." This work gives the aspect of the medical side to science and the layman, in an effort to familiarize the public with the advanced ideas of modern accomplishment and research.

Applying this theory to practice in clinical medicine, it is essential to know that without established confidence and pleasant association with our patient in the line of faith and hope in one another, little is in our power to comfort the sufferer, or aid nature in its complex art of healing.

The evidences of an instinctive law in nature, healing, in its effort of repair, are known to all of us; it seems like the supervision of a guided energy, based on a general supreme law of a universal principle, everywhere in our cosmos. This fact, which we, as scientific men, cannot deny, forms our secret backbone of success which every one of us must appreciate, acknowledge and must be aware of.

Do we realize that our opposition lays emphasis on this recognized principle as to the reliance on the "vis medicatrix naturæ" as a self-healer, speaking as well and justly of our fallacies, ignorances, mistakes and errors, putting us in the same light as we try to judge them? Religious faith and hope is claimed to accomplish healing as well, resorting to sincere autosuggestion. This seems to them to accomplish the same outcome. Let us admit that this may act beneficially, in assisting nature favorably, in many of our functional diseases, but refuse to admit of it being as highly effective in percentage of healing without assistance of intellectual material aid.

We claim scientific advantage of the educated mind over the ignorant, believing the more one knows of the physical laws of nature, the more he can proportionally prevent body and mind from physical injuries or from attack of detrimental evil influences. We can readily see the great responsibility of our professional calling. We seek information and affiliation of the laws of nature by applied rational methods, making intelligent use of the faculties of our five senses, trying to associate data and facts in orderly grouping, thus assisting with a logic of reason to serve nature as well.

Does every M.D. think of this great, most difficult subject in the light of our tremendous responsibility? Is science safe in its position? Are some doubting its advocated greatest benefit to humanity? Do we notice of late that our literary journals and daily press news are reviving a discussion of the divinic theory of evolution, relating to the genetic history of its principles as applied to science or religion? The educated layman, backed by the literary minds of some of the greater universities, asserts that the claimed progress in arts and science for the last three-quarters of a century has not enlightened our minds to greater effort at thought in social decency, politics, etc., but has degraded our tastes for the more vulgar.

Professor G. T. W. Patrick, of the University of Iowa, refers to evolution and fundamentalism in the last July number of *Scientific American,* and gives his able opinion. "It is well to have the medical profession observe such matters of importance and be impressed with the fact that bills are introduced into some state legislatures forbidding the teaching of Darwinism and biologists are refrained in conservative colleges from the liberty of expression of free thought. They are threatened with dismissal for holding the most commonplace views of organic evolution."

James Harvey Robinson, in his famous works, "The Mind in the Making," and later in his edition on the question of humanizing knowledge, tries to solve the questions of scientific education. He explains how science is falling more and more into the pitfalls of specialization, losing its perspective in concentration of our objective, and is in danger of not keeping in touch with ordinary men and women, as to their comprehensive understanding of what it is all about.

Material science in our profession must not divorce itself from pragmatic philosophy (applied psychology). Man's relation to the universe, in his conception and opinion, is varied, flexible, and depends on the intellectual recording of each one's quotient of theory and actual experience and its interpretation. It is never final, always fluctuating and only humanly relative.

PERNICIOUS ANEMIA*

ITS DIETARY TREATMENT

I. C. Brill, M.D.
PORTLAND, ORE.

Following Minot and Murphy's report upon the treatment of pernicious anemia by special diet, at the meeting of the Association of American Physicians last May, there came under my observation three cases of pernicious anemia of extreme severity.

All three patients were in their second or third relapse and the duration of the disease in each instance was longer than three years. They were all treated at the Good Samaritan Hospital under the same dietetic regime and their blood counts were done in the same laboratory.

The results were so striking and the improvement so uniform in all three cases that a brief report at this time is deemed of value, even though the number of cases reported is small.

SYMPTOMS NOTED BEFORE THE BEGINNING OF TREATMENT

Nausea and vomiting were present in two cases before treatment and extreme anorexia in the third. An advanced glossitis was present in all. One of the patients was intensely jaundiced. There were no marked spinal cord changes in any of the cases.

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* From the Medical Clinic of the University of Oregon Medical School.

BLOOD CHANGES IN THREE CASES OF PERNICIOUS ANEMIA TREATED BY SPECIAL DIET

	Case 1.			Case 2.			Case 3.		
	Hemoglobin Per Cent	Red Blood Cells	White Blood Cells	Hemoglobin Per Cent	Red Blood Cells	White Blood Cells	Hemoglobin Per Cent	Red Blood Cells	White Blood Cells
Admission	26	1,280,000	4,800	32	1,380,000	3,800	38	1,740,000	4,400
1st Week	40	1,480,000	5,400	45	2,800,000	6,200	47	2,120,000	5,000
2nd Week	55	2,430,000	6,550	54	2,800,000	7,100	70	4,510,000	6,800
3rd Week	66	3,500,000	7,600	65	4,120,000	7,000	75	4,700,000	7,200
4th Week	75	5,000,000	7,500	72	4,500,000	8,700	85	4,750,000	6,000
5th Week	83	5,000,000	8,800	90	5,200,000	9,950	95	5,030,000	9,550

However, one patient complained of numbness and tingling of the extremities. Weakness was a marked symptom in every case. Two of the patients were brought to the hospital in an ambulance. There was an absolute achylia in every instance.

RESULTS OF TREATMENT

A full diet consisting of 240 grammes of liver, 140 grammes of beef steak and an abundance of fresh fruits and vegetables was prescribed for all the patients, and within a week each patient was able to consume all the food served. There was a very prompt and rapid improvement in all the symptoms described above. The most striking change was observed in the condition of the tongue, the soreness having disappeared in each instance within the first forty-eight hours.

There was a marked and rapid gain in weight in each case. One of the patients gained forty pounds by the end of the fifth week of treatment. The other two gained approximately twenty and thirty pounds respectively. The jaundice in the one cleared up very rapidly, her color approaching normal by the end of the second week of treatment. There was a marked gain in strength so that by the middle of the second week all the patients were up and around and apparently enjoying normal health.

There was, however, no change in the hydrochloric acid content in the stomach, the achylia remaining absolute in all three cases.

The changes in the blood are indicated in the accompanying table. The rise in the hemoglobin, red blood cells, and white blood cells was strikingly uniform in all three cases. It may also be noted that the hemoglobin index, which was high in all the patients before treatment was instituted, gradually came down in each instance, reaching a normal value between the second and the third week.

There was noted a striking change in the appearance of the red cells. Irregularities in size, shape and staining, including basophilia and polychromatophilia, rapidly cleared up. By the end of the fifth week of treatment, the staining of the red cells was essentially normal, and only a moderate variation in their size and shape was observed.

Two of the patients in this group had previously been treated with blood transfusions. One of these had received five transfusions approximately six months before the special diet was started. The striking improvement that followed the dietetic management in these two patients is interesting to note in view of the observations of Minot and Murphy who state that, "Information at hand suggests that some cases in which transfusion is done many times before the diet is started may respond but little to it."[1]

COMMENT

Although the number of cases comprising this group is small, the results obtained are nevertheless noteworthy, and are therefore presented at this time. The striking improvement in all the symptoms observed uniformly in thre consecutive cases tends to confirm the opinion of Minot and Murphy that, "The dietetic treatment of pernicious anemia is of more importance than hitherto generally recognized." Attention is further called to the fact that such striking results may be obtained in patients who had previously received many blood transfusions, as well as in patients who had not been so treated.

To the time of the reading proof of this paper, approximately five months since the patients left the hospital, I have kept in constant communication with each patient. They all report they are enjoying good health and show no signs of relapse. The hemoglobin in each case now exceeds 100 per cent, and the red cell counts average over five million.

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[1] Minot, George R., and Murphy, William P.: Treatment of Pernicious Anemia by a Special Diet. J. A. M. A., 87:470, Aug. 14, 1926.

700 Journal Building.

ELECTROMAGNET EXTRACTION OF FOREIGN BODIES FROM THE EYE*

ASHLEY W. MORSE, M.D.
BUTTE, MONT.

A patient who comes to magnet extraction will always have a history of something hitting his eye. Occasionally he will insist that it was only a cinder, or that it barely touched the eye before dropping out, but that should deceive no one. It makes the examination more careful, if anything.

The patient, in describing how the accident occurred, will nearly always indicate the possibility of the flying piece being magnetic, and when there is any possibility of this being so, the magnet is tried. If the patient is seen within a reasonable time after the accident, examination will give evidence of the possibility of a foreign body in the eye. The foreign body may have dropped out, or the perforating wound suggest a foreign body, when none is present, but where it is present, there will be evidence to suggest it, when the history of the case is considered.

The examination will give valuable information as to the size of the piece and sometimes its shape, although a large piece, which is sharp pointed and long, may give a proportionately small external wound. A large body, if compact, will make a large jagged wound, lacerations and other evidences of contusion. The retina may be detached, hemorrhage severe, and there may be prolapse of the iris, vitreous or both. The very small pieces will have little to show for their presence. They are nearly always sharp on point or side, and enter with the sharp edge first, cutting their way in, and leaving a small wound which closes up quickly. Where the cases are seen early, the tension is minus. The large pieces, besides causing the more mechanical damage, are also the more likely to carry infection, with resulting panophthalmitis. The smaller pieces are believed to sterilize themselves, as, in separating from the larger pieces from which they fly, they become more or less hot and sterile before penetration. Clinical evidence supports this.

Examination will also tell one the probable depth and the position of the foreign body. The size and the position of the external wound, whether there is blood in the anterior chamber, a wound of the iris, opacity of the lens, and the condition of the vitreous will suggest the size and the position of the foreign body in the eye. Quite evidently the foreign body may be in any part of the eye-ball and in any of its structure (cornea, iris, lens, ciliary body, vitreous, choroid, retina or sclera). When it is in the anterior chamber or vitreous, it may be a moveable body. Not infrequently one can see with the ophthalmoscope the piece in the posterior segment of the eye. In three cases I have seen, with the ophthalmoscope, pieces in the vitreous.

After the history and the examination, one can determine whether an x-ray is necessary or not. Some cases will not need it. If the patient has unlimited means, an x-ray should be taken. If he has not, and one can see the foreign body with the ophthalmoscope, an x-ray is an unnecessary expense to him.

If the wound is a large one and quite evident, no matter what the x-ray shows, the point of application of the magnet would be at the site of the wound. Then an x-ray is not absolutely necessary. On the other hand, if the lens is opaque or if the anterior chamber is clouded, and the external wound small, the x-ray is indispensable, as it accurately localizes the foreign body, gives its size, and permits the operative route to be the most direct through the least vital structure.

Some operators always bring the foreign body out through the anterior chamber, either through the original opening or through a corneal incision, and in such operative technic an x-ray is not needed. I am informed that Haab still operates in this way, and does not take x-ray pictures because his procedure is the same, no matter where the foreign body is located. I think even those who favor the anterior chamber route believe there are exceptions to this rule, and the x-ray would indicate those cases.

Some consideration must be given to the magnet best suited for the work. A giant magnet is absolutely necessary for the smaller pieces, if they are to be removed with the least possible damage. On the other hand, if the foreign body is comparatively large, the giant magnet on full force may do considerable harm. The current may be cut down with a rheostat, or the strength of the magnet may be reduced by a flexible extension with tip, which makes out of the giant magnet one comparable to the hand magnet. Many prefer the hand magnet for the large pieces. Everyone will use the particular magnet to which he has become accustomed and with which he has been most successful. He will have success if he keeps in mind this simple rule, to use only as much magnetic force as will pull the foreign body through the wound or opening with the minimum traumatism.

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* Read before the Forty-eighth Annual Meeting of Medical Association of Montana, Billings, Mont., July 16-17, 1926.

After locating a foreign body in an eye-ball, the actual removal of it with the electromagnet is never the same in any two cases. No two foreign bodies are the same shape and size, nor do they penetrate at similar points, or come to lie in the same position within the eye-ball. Therefore, their removal is more or less different in each case. There are, however, two principal routes, the anterior chamber route and the scleral route. One could, perhaps, say that in the anterior chamber route the operation would always proceed in the same way, but even in this there would be many variations. For example, if the foreign body becomes lodged behind the iris, the procedure would be more complicated than if it readily came through the pupil so as to lie in front of the iris. In the classical anterior chamber route the foreign body is pulled around the lens through the zonula of Zinn, and appears behind the iris, where it bulges a little. The current is at once released, and the magnet applied over or across the pupil opposite the foreign body so as to pull it through the pupil, where it can then be removed through a corneal incision or through the original opening.

In the scleral route the conjunctiva is dissected up over the site of the incision, which by choice avoids the muscle attachments and the ciliary body. A meridianal incision is made as short as possible, considering the size of the foreign body, and the magnet point brought up to and in the incision, and the current turned on. If it is impossible to extract the foreign body, a cut at right angles is made, making a T or a crossed incision, and the blunt point of the magnet is placed in the incision without deep penetration into the vitreous, and the current turned on again. Deliberation is essential. It is better to hold the point in contact for from one-half a minute to a minute, then move it away slowly so that the foreign body can find its way through. If this fails, turning on the current and releasing it several times will often bring results. Perhaps the scleral opening is too small.

Then we consult the x-ray picture to make certain, and observe the extent and the position of the pull of the magnet on the metal. It will give one evidence of what to do. When it is found absolutely impossible to dislodge the metal without penetrating the vitreous, the introduction of a small tip into the vitreous, a steel probe, or a scissors which can be made to cut while in contact with the magnet, especially when the foreign body has been in the eye-ball some time and is surrounded by organized exudate, should be tried.

After working a reasonable time without results, it is better to stop and wait twenty-four hours. A great many times a removal, which was impossible on the first day, has been done on the second day. If the patient is not too tired, one can work from three-quarters of an hour to an hour, but longer at a time is usually not successful. In one case we worked an hour each day for three days before getting a small piece of metal, and saved the eye with a fair amount of vision. If one is gentle in his manipulation, these cases seem to make as rapid recoveries as those where the removal has been done in a short time, and the ultimate vision is as good.

It seems to me that certain cases are better done by the anterior chamber route and certain others by the scleral route. If the foreign body is anterior to the vitreous, that is, in the lens or anterior chamber, of course it should come out through the cornea, either through the original opening or through an incision. If the lens is opaque, and the foreign body is small and can be readily brought through, it would be better removed in that way and the traumatic cataract immediately removed. If the corneal incision is small, the cataract removal is best done by suction through a needle. When this is done, recovery is very much sooner and with decidedly less reaction. On the other hand, if the lens is clear, and the foreign body is in the vitreous, the scleral route is better. If the foreign body is large and in the vitreous, or if it does not readily present when the magnet is placed over the center of the cornea, the scleral route is better.

I have only once seen reaction after the extraction through the sclera, and that may have been due to the contusion and injury of the ciliary body, as the whole vitreous was filled with blood. The foreign body entered through the cornea scleral margin, apparently going through the ciliary body. Opponents to this route claim that detachment of the retina, choroidal hemorrhage, more danger of infection and degeneration of the globe are more likely to follow that than the anterior chamber route.

The critics of the anterior chamber route point out the danger of injury to the ciliary body, the lens, and the possible entanglement in the iris, with the possibility of an iridectomy or an iridodialysis being necessary. If one has any of these complications, he will probably agree that in that particular case the other route should have been chosen.

We have had cases where the scleral route was used and normal vision retained. We have also had as many cases where the anterior route was used, resulting in normal vision, so I feel that either method is safe in the right case. The ultimate results in removal depend a great deal on the amount of damage done to the eye when the injury occurs. If the eye is severely contused, no matter how skillfully one removes the foreign body, vision is out of the question. The object is to remove the foreign body without further damage.

The results in magnet extraction, as far as the usefulness of the eye is concerned, should take into consideration the condition of the eye before the steel was removed. That would really show a high percentage of useful vision in the cases which were not destroyed by the injury before removal.

The operative procedure in most of our cases has added very little traumatism to that already there from the injury. In looking over reported series, this does not seem to be taken into account. I shall report briefly only twenty-five cases taken consecutively as they came to the office. I have selected these because in this group it was my good fortune to do most of the work. If Dr. Donovan were reporting, he could give a much larger number of cases.

(a) Vision 20/20, or better	5
(b) Vision 20/50, or better	2
(c) Vision 20/100, or better	3
(d) Cataracts with good light perception and projection, but not operated on because other eye was good	5
(e) Patients sent home early to their family physicians and not followed up as to results	5
(f) Panophthalmitis and enucleation	2
(g) Shrunken eye and late enucleation	2
(h) Shrunken eye not enucleated	1

To summarize briefly, first, and most important, be on the alert for these cases, and do not overlook a foreign body in the eye; second, accurately localize the foreign body in the eye; third, remove it with the least traumatism possible.

ELECTRIC CAUTERY VERSUS STURMDORF OPERATION. Harvey B. Matthews, Brooklyn, N. Y. (Journal A. M. A., Nov. 27, 1926), compares the results of the cautery treatment with the Sturmdorf enucleation operation for the cure of chronic endocervicitis. He says that cauterization is, for the majority of cases, an office procedure, whereas the Sturmdorf operation requires hospitalization or its equivalent with anesthesia—local, regional or general. Cauterization is primarily a prophylactic measure which, if properly employed early in the course of chronic endocervicitis, will obviate the necessity of operation later when the infection becomes more widely and deeply disseminated. Cauterization is more successful in those cases in which the infection is superficial and the lacerations not extensive. There is a type of hyperplastic cystic endocervicitis encountered during the childbearing age (infection of long standing) in which cauterization is contraindicated because of the resulting scar formation with possible stricture or stenosis of the cervical canal. The Sturmdorf operation will remove the infected cervical mucosa with its glands, and is therefore preferable. Cauterization is most successful in destroying the infected cervical mucosa after the menopause or preceding supracervical hysterectomy when further menstruation is impossible. The Sturmdorf operation is primarily indicated in those cases not suitable for cauterization; i. e., infection of long standing, deeply disseminated, with cystic changes encountered during menstrual life. The Sturmdorf excision is distinctly an operation requiring some form of anesthesia and probably hospitalization, whereas the cautery operation is essentially on office procedure. Therefore, Matthews does not believe that one method supplants the other, but rather that both are good methods; in fact, the very best we know of today. Pregnancy and labor are not interfered with in any way by the superficial and moderately deep cauterizations of the cervix. The deep and more extensive cauterizations under anesthesia, naturally, are more apt to cause complications during pregnancy and labor, although six of fifty-five cauterized patients under anesthesia had perfectly normal labors.

DEEP ROENTGEN-RAY THERAPY IN TREATMENT OF CARCINOMA OF BLADDER. One hundred and twenty cases of bladder tumor treated by radiotheraphy are analyzed by Charles A. Waters, Baltimore (Journal A. M. A., Nov. 13, 1926). He says that the best treatment for superficial papillary carcinoma, whether localized or extensive, is a combination of deep roentgen-ray therapy with applications of radium applied directly to the surface of the growth. Radium alone has been very successful in handling this type of case, but frequently so much radiation is required that the destruction of the tumor is followed by a severe radium ulceration. In his experience, the results obtained by the combination of deep roentgen-ray with radium are better when the tumor has received from 600 to 800 milligram hours of radium before the roentgen-ray treatment is started. By the combination of radium with roentgen-ray treatment, most of these tumors can be destroyed with a minimum amount of injury to the bladder, and in many instances with but little or no irritation of the bladder mucosa. When the growth is an infiltrating carcinoma, though still operable, Waters believes that radical resection should be carried out, since it offers the greatest chance of complete cure. Twenty-five per cent of the infiltrating growths in the series of cases reported on by Waters occupy positions that render them inoperable, or they are so extensive that radical removal is impossible. In this group, when it is possible to apply radium directly to the growth, both radium and deep roentgen-ray treatments should be given a trial, for in a certain number of the cases favorable results can be obtained by this method alone. But in cases in which this procedure does not yield the results hoped for, or in cases in which one feels that the growth is sufficiently localized to warrant implantations of radium needles, the bladder should be opened suprapubically, and screened radium needles should be implanted throughout the growth. But if the growth is so extensive that a total of more than 2,500 milligram hours is necessary, in order thoroughly to destroy the cancerous areas by implantations, this method should not be considered.

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EDITORIAL

PROGRESS IN OXYGEN THERAPY

The rationale of the treatment of anoxemia by oxygen administration has long been recognized. There has been in the past, however, a general lack of understanding as to the type of case suitable for oxygen therapy. In addition, methods of administration have been haphazard and ineffectual. As the result of this physicians have lost confidence in this mode of treatment and have been inclined to use oxygen only as a means of last resort. To the relatives of the patient the presence of the oxygen tank in the sickroom is too often an omen that exitus is close at hand.

The specific abnormality in function which calls for the use of oxygen is acute anoxemia, i. e., a diminution in the oxygen-carrying capacity of the blood. This is recognized clinically by the presence of cyanosis, rapid shallow breathing, and in extreme cases by unconsciousness. Anoxemia may be due to a crippling of the power of hemoglobin to form oxyhemoglobin as the result of poisoning by carbon monoxide, nitrites or chlorates. By therepeutic administration the amount of oxygen which exists in simple solution in the blood is increased sufficiently to tide the patient over the critical period of elimination of the poison. Henderson[1] of Yale has pointed out the value in treating carbon monoxide poisoning of adding to the oxygen a small amount of carbon dioxide for the purpose of stimulating the respiratory center.

By far the most frequent cause of acute anoxemia is a diminution in oxygenation of the blood during its passage through the alveolar capillaries. This disturbance occurs in such conditions as pneumonia, pulmonary infarction, multiple embolism, atelectasis, etc. It is the result of interference with alveolar blood supply by inflammatory swelling and exudation, and of decreased aeration in the alveoli, due to blocking of the air passages and collapse of lung tissue. Recently several investigators, using improved apparatus, have reported gratifying results following the employment of oxygen in the class of disorders mentioned, notably in pneumonia. According to Barach[2] not only was the cyanosis relieved but other symptoms such as dyspnea, tachycardia, restlessness, and delerium were likewise ameliorated. This author emphasizes that oxygen therapy should be instituted early, at the first sign of cyanosis in the finger nails, and that it should be used continuously. He found that the cyanosis of cardiac decompensation was not reduced by this treatment except in those cases where a coexisting pulmonary edema had further reduced the alveolar oxygenation of the blood. In chronic emphysema the use of oxygen was followed by only temporary improvement.

By clinical experiments Barach and Binger[3] have determined that to be of therepeutic value the content of oxygen in the inspired air must be at least 30 per cent, preferably 40 to 50 per cent. The commonly used tube and funel method provides less than 3 per cent above the oxygen content of atmospheric air and is consequently quite useless. On the other hand, oxygen in a concentration above 60 per cent is to be avoided because it acts as an irritant to the lungs. With a cooperative or quiet patient oxygen may be effectually administered by a nasal catheter, mouth tube, or by a face mask with rebreathing bag. These methods, however, are usually not suitable for continuous therapy. The most efficient devices for prolonged administration of oxygen are the oxygen chamber, as constructed by Binger[4] at the hospital of the Rockefeller Institute, the portable oxygen tent of Barach and Binger[3], and the simplified head tents of Roth[5] and of Barach[6]. In these apparatus large tanks of commercial oxygen have been substituted for the more costly and bothersome small cylinders commonly employed in hospitals. Provision has been made for cooling and ventilation of the oxygenated atmosphere and for the removal from it of excess moisture and carbon dioxide.

A more general appreciation by physicians of the indications for and the possibilities of the clinical use of oxygen should lead to the equipment of hospitals with efficient systems for administering this valuable therepeutic agent. We may then anticipate the elevation of oxygen therapy to a more respected place among the physician's armamentarium than it enjoys at the present day.

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[1] Henderson, Y. and Haggard, H. W.: The Treatment of Carbon Monoxide Asphyxia by Means of Oxygen and Carbon Dioxide Inhalation. J. A. M. A. 79:1137, Sept. 30, 1922.

[2] Barach, A. L.: The Therapeutic Use of Oxygen in Acute Respiratory Disturbances. M. Clin. N. Am. 9:471, Sept. 1925.

[3] Barach, A. L. and Binger, C. A. L.: A Portable Oxygen Tent. J. A. M. A. 85:190, July 18, 1925.

[4] Binger, C. A. L.: The Construction and Management of an Oxygen Chamber. Mod. Hosp. 24:186, Feb., 1925.

[5] Roth, P.: An Improved Apparatus for Therapeutic Administration of Oxygen. Mod. Hosp. 22:404, April, 1924.

[6] Barach, A. L.: A New Oxygen Tent. J. A. M. A. 87:1213. Oct. 9. 1926.

IT SOOTHES THE NERVES

One of the most pernicious effects of the World War was the popularization and respectabilization of the cigarette habit which was largely contributed to by an advertisement, "It Soothes the Nerves," that, spread upon the sign boards and by the newspapers of the country, was as successful though undesirable a form of propaganda as was ever foisted upon a long suffering public. The need of tobacco is purely an acquired habit and comforts arising from it are in large part, though not entirely, psychologic. An unrefuted advertisement such as the above, kept constantly before a people, excited and agitated by a great calamity such as the war, was sure to be accepted by many people at its face value.

Moderate use of tobacco may not be especially injurious to many of its devotees, nor is the cigarette worse than the cigar or the pipe, but every form of tobacco is toxic. In beginning users it increases the pulse rate and causes blanching of the skin accompanied by nausea, and often vomiting with many other toxic phenomena. Of particular interest to physicians should be the fact that even in accustomed users it causes malodorous breath and makes them offensive to many persons with whom they come in contact, and as a result a very considerable proportion of the public will not go to a physician or dentist who uses the weed. On most oceanic liners smoking is prohibited in the dining room because the slight nausea which often attends a voyage, even on calm seas, is increased by any unpleasant odor, especially that of tobacco.

With the war the use of tobacco was approved by many, who under normal circumstances would never have considered it within the limits of propriety. The soldier in the wet cold trench or exhausted from a long march, or depressed or excited by his experiences, believed himself soothed and undoubtedly was soothed by cigarettes. Those who stayed at home in the comfort of their own firesides were more than willing to send them to him, if thereby they might add an iota to his comfort. But such conditions are quite different from those that prevail at home. Millions of boys came to believe that the cigarette was soothing and beneficial and that smoking was a manly and desirable habit to acquire. Relatively few boys held out against the temptation, yet business men, even though they use tobacco themselves, almost invariably object to its use by adolescent employees, and seem to regard the habit as a symbol of inefficiency. Youth, however, is hard to convince and so a vast majority of the lads of today, largely through imitation, have entered or are entering upon a practice which can do them no good and which, if carried to excess, will do them harm.

Woman signalized her newly acquired liberty by widespread indulgence in cigarettes and in many instances has gone rapidly to an extreme such as happens infrequently with men, and then only after a much longer period of use. She has the same inherent right to use tobacco as her brother but commonly she uses it much more ostentatiously than he. It is not unusual for a group of girls who are together on vacations to rise in the morning and rush for cigarettes before they perform their ablutions, a practice which, indulged in by men, stamps them among their fellows as "fiends." All of which is said with no invidious or critical attitude toward our sisters but as a kind of estimate of certain psychologic differences between the two sexes, and as at least hinting at the belief that tobacco is more injurious to women than to men.

The writer would not, if he could, prohibit the use of tobacco by law, believing that results may best be accomplished by instruction, though even the effects of this are not roseate. But false and laudatory advertising of tobacco as health-giving should be prohibited because it is untruthful. Even though prohibitions of advertising of tobacco would be unwise, the propagandists might be made to stick to the truth which would compel them to limit advertising to little more than the names and possibly comment on the flavor of their products.

But there is an important method which in individual cases is sometimes effective and that is to urge boys and girls to refrain from smoking until they are of age; or even for employers to refuse to give jobs, especially clerical and indoor jobs, to smokers who are under age, a modification of a method that big business applied with considerable success to the alcoholic problem. Those who do not smoke until they have passed their majority will rarely become heavy smokers. The best cure for the tobacco habit is prophylactic and if physicians, even though they themselves are smokers, would use their influence along the lines indicated, temperately and without fanaticism, much good might be accomplished.

A GIGANTIC FRAUD

So long as the world is filled with credulous individuals who, in the presence of chronic diseased conditions, will pay out good dollars for any bizarre form of treatment which is presented with exaggerated and positive assurance of cure, medical frauds will continue to be devised and exploited before the public. Although many ridiculous and absurd impositions and frauds are being continually exposed and suppressed, new ones are being flaunted with equal rapidity, since it is so well known that a sucker is born every minute and looking for something new on which to gorge himself. The latest wholesale fraud now being perpetrated on the Pacific Coast is the "Ionaco," introduced and exploited by Galyord Wilshire, erstwhile Los Angeles real estate promoter. After reaping a rich financial harvest from the gullible in California, he has turned his attentions to Oregon and Washington and soon will move on to Idaho and Montana on his way East.

This contraption, which people are tumbling over each other to purchase at $65 each, consists of about a half mile of cotton covered copper wire, coiled in the form of a belt, within which is 200 feet of small wire connected with a small electric lamp. When this belt is connected with an electric light socket the patient experiences a slight sensation of warmth. Examination has disclosed that, though it produces a mild electric current, this can result in no electrical effect upon tissues of the body. While its promoter sagely asserts it magnetizes the iron in the blood, the latter, being of a nonmagnetic form, cannot be influenced by an electromagnetic field. The total cost of the material in one of these belts is $5.75. The profit, when sold for $65 each, can readily be calculated.

By means of extensive advertising in the daily papers and addresses broadcast by radio, this imposter, Wilshire, is transmitting to the public the belief that this collection of wires, when worn about the neck or body, cures tuberculosis, cancer, Bright's disease and a long list of other chronic disorders. The proof of the absolute fraud of this apparatus, the fact that it is totally inert in the treatment of disease, and that this charltan is abstracting large sums of money from guileless and deceived members of the community have been presented to the daily papers in the cities where large advertisements are being carried by this faker. The newspapers publishing these advertisements have refused either to publish the facts regarding this hoax or to abstain from carrying fraudulent statements concerning its therapeutic value. The Better Business Bureau, however, has taken up the matter and, in conjunction with others who are attempting to enlighten the public regarding this fraud, will use its efforts to expose and suppress this conscienceless imposter.

EFFICIENCY OF UNITED EFFORTS

For several years a struggle has been in progress in Washington between the forces endeavoring to enact legislation promoting public health and individuals with noticeable political influence who have persistently labored to suppress such public health efforts. In the last session of the legislature the antagonistic forces succeeded in blocking the passage of public health laws. During the period preceding the election of last month a campaign of education was conducted by the Public Health League, physicians and others, by which the public was informed of the attitude of legislators opposed to public health measures. As a result, several of these opposition leaders fell by the wayside when the votes were counted. Members of the House from Pierce, Walla Walla and Grays Harbor counties, who had been most virulent in their legislative opposition, were among those who were defeated. The most outstanding spokesman for the cults in King county was saved by a majority of only five votes, and he professed a change in his convictions during the course of the election campaign.

As the result of the election the following five physicians will serve in the next legislature: Dr. Walter Taylor, Port Angeles, was elected to the Senate, while Drs. Warren Karshner, Puyallup, and J. C. McCauley, Ellensburg, are hold-over senators. Drs. J. A. Durant, Snohomish, and A. F. Brockman, Bickleton, were elected to the House. While it is not possible at present to predict the attitude of legislators on public health matters, it is believed there will be a sufficient number favorable to the contemplated public health measures to assure their passage, even over the governor's veto, if this issue be again encountered.

CONFERENCE OF SECRETARIES AND EDITORS

The annual conference of secretaries of state medical associations and editors of state medical journals, was held in Chicago November 19–20, under the auspices of the American Medical Association. It was attended by secretaries from nearly all of the states, including those from Oregon, Washington, Idaho and Montana as well as the editor of NORTHWEST MEDICINE. The purpose of this conference is to bring together in close relationship the executives of the different state associations, in order that they may exchange views and hold discussions on problems of common interest and matters which will promote the welfare of the profession in the different states. One is impressed on these occasions by the solidarity of the profession in all sections of the country. Regardless of geographical location, one encounters the same sort of experiences and learns that there are few medical problems peculiar to himself and his locality, although there may be diversified details and varied angles of viewpoint.

The question which received most attention was the periodical health examination. Besides several formal addresses on this subject, the secretaries were called upon alphabetically by states to report the progress of this movement in the individual states. It was disclosed that in a few this work has been established on a firm basis and actually functioning in personal examinations of the physicians and among the patients of a considerable number. In other states it is under active discussion, while elsewhere the whole question is received with indifference and nothing has been done for its promotion. It was interesting to observe that Dr. Stricker, the secretary from Oregon, reported work which places it among the most advanced in the development of periodic health examinations. This was the outstanding report among the states of the Northwest.

The address by Dr. Schauffler, of Kansas City, on the subject of educating the physicians for public health speaking was impressive and suggestive. The ordinary physician is rarely at ease on his feet, addressing an audience. To be effective in this line of work, he needs instruction in the elementary principles of oratory and public speaking. Such instruction was recommended as a preliminary in promoting the propaganda for periodic health examinations. If one purposes seriously to undertake this work, such preliminary instruction would be highly advantageous. The opinion prevailed among representatives from all sections of the country that the periodic health examination will not only promote the future wellbeing and happiness of the people, but it will result in material benefit to the medical profession by retaining in their grasp a form of service, to which they are entitled as well as its financial remuneration, which is destined to become the province of lay organizations which are already becoming firmly established, unless the physicians of the country are awakened to the situation and prepare themselves to retain that which legitimately belongs to them.

SEPARATION FROM MONTANA

At last summer's annual meeting of the medical association of Montana, it was voted to cancel the agreement with NORTHWEST MEDICINE for 1927, by virtue of which the latter has served as official journal for this organization. For the coming year a bulletin will be published to report the transactions of the annual meeting. Otherwise this association will not be represented among state medical association journals. The relations which in the past have existed between this journal and the Montana association have been satisfactory and it is believed have been mutually beneficial.

MEDICAL NOTES

ERRATUM. In the paper in our October issue by Dr. Paul E. Spangler on "Gwathmey's Syrengistic Analgesia in Obstetrics," an error appeared in the formula presented on page 542. It is stated that "quinine hydrobromide gr. 20 is dissolved in oz. 3 of alcohol." This should have read "drams 3."

INTERSTATE POSTGRADUATE ASSEMBLY OF NORTH AMERICA. In May, 1927, under the auspices of this organization, a foreign assembly will be conducted to visit the leading medical centers of the old world, including London, Edinburgh, Oslo, Stockholm, Upsala, Lund, Copenhagen, Hamburg, Leipzig, Munich, Strasbourg, Heidelberg, Frankfort and Paris. The group of physicians will be limited to a number that can be comfortably accommodated in the clinics in these cities. The price of the trip, which will include first-class accommodations, will be $1000 to $1100. Further information may be obtained from the managing director, Dr. William B. Peck, Freeport, Ill.

OREGON

PLAN CONTAGIOUS HOSPITAL. A petition from physicians of Bend for a municipal contagious disease hospital was submitted to the city council Nov. 7. Dr. C. A. Fowler, city health officer, pointed out the fact that at present there are no hospitals in Bend which will admit patients suffering from communicable diseases. Facilities are also lacking for the detention and treatment of venereal diseases.

VALE BIDS FOR TUBERCULOSIS SANATORIUM. The Commercial Club of Vale has started a campaign to make that city the location of the proposed Eastern Oregon Tuberculosis hospital. The citizens of Oregon at the last election authorized the construction of this institution to care for the needs of the eastern portion of the state.

HOSPITAL IS BENEFICIARY. Mrs. Elizabeth A. Glisan, who died recently in Portland, has bequeathed the sum of $10,000 to the Good Samaritan Hospital.

New Indian Hospital. A new 50-bed hospital for the Indians of the Klamath Reservation is now in process of construction.

Gift to Medical School. Miss Mary F. Faling, of Portland, has donated $3000 to the University of Oregon Medical School, to be used for the purchase and installation of an electrocardiagraph.

Campaign for Diphtheria Prevention. The medical advisory committee of the Marion-Polk-Yamhill Counties Medical Society met recently with Drs. Walter Brown and Vernon Douglas of the Marion County Child Health Demonstration, for the purpose of instituting a tricounty campaign for the prevention of diphtheria.

The Central Willamette Medical Association, at a meeting in Eugene Nov. 4, was addressed by Dr. T. Homer Coffen of Portland. His subject was the diagnosis and treatment of goiter.

Dr. Earl Smith, coroner of Multnomah county, was admitted to the Good Samaritan hospital at Portland Nov. 15, suffering from an abdominal ailment.

Dr. E. Nelson Neulen, of Astoria, has sold his interest in his eye, ear, nose and throat practice to his associate, Dr. S. A. Klegar. Dr. Neulen will open an office in Portland.

Dr. E. J. Jasper, who has practiced for several years in Westport, has moved to Astoria.

Dr. E. Rea Norris has located for practice in Oregon City. He is a graduate of the College of Physicians and Surgeons of San Francisco.

Dr. Edgar S. Forner, formerly of Ontario, Ore., has entered into partnership with Dr. J. H. Garnjobst, at Salem.

Dr. Henry de Lespinasse, formerly of Oregon City, Iowa, has opened an office in Hubbard.

WASHINGTON

Hospital Bond Issue Defeated. The voters of Clallam county, at the last general election, voted by a narrow margin against the issuing of bonds for the erection of a city-county hospital at Port Angeles.

Addition to Sanitarium. A formal opening was held at the Cascade Sanitarium in Leavenworth to permit public inspection of recent additions and improvements. There are now facilities for the care of 50 patients. Dr. Albert Lessing is director of the institution.

Soap Lake Desires Veterans' Hospital. United States Senator C. C. Dill, at a meeting at Soap Lake Oct. 21, requested the aid of local citizens in placing before Federal authorities the advantages of locating a Veterans' hospital at Soap Lake.

Voted Improvements to Sanatorium. The Seattle City Council, Oct. 18, authorized the expenditure of $364,000 for improvements for Firlands Sanatorium. Two additional fresh-air pavilions are to be provided.

Aid Needed for Tuberculous Indians. Mrs. Bethesda Beals Buchanan, executive secretary of the Washington Tuberculosis Association, who returned recently from the national tuberculosis convention in Washington, D. C., states that the department of Indian affairs recognizes the present lack of proper care for Indians suffering from tuberculosis. There are now many untreated cases in the Indian reservations in the different states, including Washington. Congress may authorize funds in the near future to provide for this neglected duty.

Plan Tricounty Association. Thirty-five physicians from Lewis, Cowlitz and Clark counties met at a banquet in Longview Nov. 9, for the purpose of organizing a tricounty medical association. Addresses were made by Dr. H. J. Willard, Tacoma, president of the Washington State Medical Association; Dr. George W. Dowling and Mr. Robert O. Jones, of Seattle, executive chairman and secretary, respectively, of the Washington Public Health League. Dr. J. B. McNerthney, of Tacoma, read a scientific paper on the subject of goiter.

Stevens County Medical Society met in Colville November 20. Papers on the subject of infections and nutritional disturbances in children were read by Drs. W. H. Gray and W. A. Olds.

Lectures at University. Dr. Warren M. Karshner, of Puyallup, delivered on Nov. 10, the second of a series of popular lectures sponsored by the College of Science of the University of Washington. His subject was "High Lights of Twenty Years Practice."

Organize Clinic Staff. The physicians serving in the Junior Red Cross Clinic, Seattle, recently formed an organization for the purpose of holding monthly staff meetings. Dr. L. L. McCoy was elected chairman.

Provide Tuberculosis Nurse. The Clark county Antituberculosis League has made provision for the employment of a nurse to carry on educational work against the white plague in Clark county. Miss Laura Bolch has been appointed to the position.

Dr. H. A. Erickson, for the past two years director of the Walla Walla Sanitarium, has resigned. After a period of postgraduate work in Edinburgh, Scotland, he will go to Bechuanaland, Africa, to take charge of an Adventist hospital.

Dr. A. E. Anderson, of Hoquiam, who is convalescing from a protracted illness at the Hoquiam General hospital, was the guest of honor at a duck feast given at the hospital Oct. 20 by the members of the Hoquiam Medical Society.

Dr. J. W. Snoke, of Tacoma, has been compelled by ill health to give up active management of his private sanitarium. He has gone East for medical treatment and rest.

Dr. John O'Shea, of Spokane, assistant secretary of the Washington State Medical Association, has been seriously ill with pneumonia at the Sacred Heart hospital at Spokane, but is reported to be out of danger.

President of Association. Dr. J. H. McCormack, of Mabton, who is at present doing postgraduate study in Vienna, has been elected president of the American Medical Association of Vienna.

SEATTLE PHYSICIAN HONORED. The appointment of Dr. George W. Swift, of Seattle, as a member of the board of directors of the Gorgas Memorial Institute was announced recently by Dr. Franklin Martin, of Chicago, president of the institution.

DR. W. W. WEBB, of Winlock, is ill at the Portland Medical hospital, Portland, Ore.

MEDICAL WEDDING. Dr. Charles D. Shannon, of Seattle, and Miss Elsie B. Baumann, of Walla Walla, were married in Seattle Nov. 22.

IDAHO

Dr. E. S. Spohn, of Coeur d'Alene, has been placed in charge of the Walla Walla Sanatorium at Walla Walla, Washington.

MONTANA

NEW HOSPITAL OPENED AT HAVRE. The Kennedy Deaconess hospital, at Havre, was formally dedicated Oct. 24, by Bishop H. Lester Smith of the Methodist Church. The building is four stories in height and is built of brick and reinforced concrete. The surgery, x-ray and laboratory have been completely equipped with up-to-date apparatus. The total bed capacity is 55. The Rev. Alexander Muirden and Miss Ruth E. Robertson are manager and superintendent, respectively.

HEADS HOSPITAL STAFF. Dr. C. S. McKenzie was recently elected president of the medical staff of the Kennedy Deaconess hospital, at Havre.

DR. J. M. MCGREGOR, of Choteau, who has been operating the Glenwood hospital in that city, has disposed of his interests in the hospital and will move to Great Falls.

DR. W. E. WARNER, bacteriologist of the research department of the Mulford Company, Philadelphia, was a recent visitor in Anaconda.

DR. ELLIS A. JOHNSTON, of Helena, has left for six months postgraduate study at Rochester, Minn., and Chicago.

OBITUARIES

DR. CHARLES E. HILL, pioneer physician and surgeon of Portland, Ore., died suddenly at his office, Oct. 25, aged 59 years. He was born in Portland in 1866 and graduated from the Willamette University Medical School in 1890. He had practiced continuously in his native city since 1891. He was captain in the medical corps at Camp Oglethrope, Ga., during the world war.

DR. HORACE B. FENTON, of Portland, Ore., died at St. Vincent's hospital No. 7, aged 42 years. He was born in 1884 at Lafayette, Ore., and graduated from Johns Hopkins University Medical School in 1910. He had been engaged in practice until a year ago when he was forced to retire on account of ill health. He is survived by a brother, Dr. Ralph Fenton of Portland.

DR. ELBERT E. FISHER, of Salem, Ore., died at a local hospital on Oct. 21, aged 56 years, as a result of a streptococcus infection of the arm. He was born in Omaha, Neb., in 1870, and graduated from Sioux City College of Medicine in 1898. He had been engaged in practice in Salem since 1908. His will has provided that the residue from his estate be given to Willamette University.

DR. JOHN J. WOTHERSPOON, of Seattle, Wash., died at his home Nov. 7, following a long illness, aged 28 years. He was born in Seattle in 1898, and was the son of Dr. and Mrs. John Wotherspoon who survive him. He graduated from Northwestern University Medical School in 1924. After a year's internship at the Seattle City hospital he practiced at Noorvik, Alaska, until his ill health forced him to return to Seattle.

REPORTS OF SOCIETY MEETINGS

OREGON

MARION-POLK-YAMHILL COUNTIES SOCIETY

Pres., L. O. Clement; Secty., W. H. Barendrick

A meeting of Polk-Yamhill-Marion Counties Society was held November 16 at Salem, Ore., in honor of the late Dr. E. E. Fisher who died from acute infection at Salem Hospital, October 21.

Dr. B. L. Stevens presented to the society the following:

REMARKS IN MEMORIAM

Since our last meeting death has again visited us and taken from our midst one of the prominent members of our association, Dr. E. E. Fisher. He had just completed a term as president of this society, a position which he filled in highly acceptable manner. There have been many good presidents of this society, but none better than Dr. Fisher. Always active and energetic in his profession he had become a skilful physician and an accomplished surgeon. He was greatly interested also in civic affairs, and gave his time freely to civic betterment. Both as a physician and a citizen he will be missed.

For the fourth time in as many months a member of our society has answered the last call. In each instance, with one possible exception, each of these men was in the prime of life and at the peak of his activity and usefulness. Each had an extensive practice and enjoyed in a large measure the confidence and respect of his community. I refer to Dr. C. E. Cashatt, of Salem, Dr. Otis Butler of Independence, Dr. W. H. Lott, of McMinnville, the president of our society, and Dr. Fisher, his immediate predecessor in office.

It is extremely fitting that we pause a moment in tribute to the memory of these men, to forget and condone their faults, for they had a few; to extole and emulate their virtues, for they had many. It is fitting also in view of the uncertainty of life as exemplified by their untimely deaths that we solemnly contemplate for a moment the change which has come to them and which assuredly, too, must come to us. To us who survive any reflection of this sort has a peculiar appeal. We acknowledge a kinship with the departed; what they have experienced we too must experience. Each of us must tread the pathway alone, but we know that all the countless myriads who have lived and died, and those countless myriads which shall yet live and die are our sure companions.

When we survey this vast multitude we are impressed with a sense of our own insignificance. We are but atoms in the great cosmos of nature. "When I survey thy Heavens," said the psalmist, "the moon and the stars which Thou hast ordained, what is man that Thou art mindful of him, or the Son of Man that Thou visitest him." We may appoint our greatest telescope into the heavens, and with its powerful lenses fix the most distant star which has yet been discovered, estimated to be in diameter greater than the earth's orbit, and a million light years away. (That is to say, light eminating from this star and traveling at the rate of 186 thousand miles a second would take a million years to reach this planet.) And, if we could mount on a sunbeam and with the wings of the morning traverse that immeasurable distance, and having arrived there could look out farther into space, we have every reason to believe that away out yonder, a million light years beyond, we would see another star shining, serene and eternal, and so on and on throughout a space as boundless as eternity. Brooding over this vast universe, holding it in the hollow of His hand is that divine intelligence, which we call God, immutable, omnipotent, infinite and utterly incomprehensible to finite minds because of that infinity.

"Our little systems have their day,
They have their day and cease to be,
They are but broken lights of Thee
And Thou, O Lord, art more than they."

Our lives are but scintillations from the great source of all life visible for an instant and then gone. We are but motes in the sunbeam. We are but wavelets projected upward for an instant from the bosom of the ocean, only to fall back once more into its illimitable expanse. We are but units in an innumerable multitude, traveling we know not whence and we know not whither. The stream of life emerges from a cloud beyond which no mortal eye can see, and enters a cloud through which no mortal eye can penetrate. That which is visible to us is only the definite portion of eternity which is called time, and only part of which we have personal knowledge, is that infinitesimal portion allotted to the span of human life.

What is the meaning of this great restless migration, and to what country do these travelers tend? That is the question which has intrigued mankind throughout all generations. The answer has not been found. I think we doctors more than any other class are inclined to be materialists. We study the beginning of life, we see its end, and we are apt to conclude that death is indeed a cessation of all vital activities, and that with death we cease to exist. But yet the greatest minds of all ages have found an abundant reason for a faith in immortality. Only faith or fancy, however, can depict what lies beyond. Religion does not furnish the answer.

Religions differ in the standards of ethics they set up, but they are all alike in their ignorance of the future. They are alike in this, however, that they all have a persistent belief in a future existence and perhaps in the very universality of their belief lies the strongest argument for this faith. The Mohammedan has his Happy Isles; the Hindu, Nirvana; the Christian, Heaven. The Viking had his Valhalla, the Indian his Happy Hunting Ground. In all these faiths men have died with enthusiasm, with resignation, with hope, firm in a belief in a life after death, but those with no particular convictions as to a future life have died equally well.

Socrates drank the hemlock cheerfully and, while awaiting the lethal effects of the poison, discoursed on death. He took the position of the agnostic and said that whether death were an eternal sleep or whether there were a conscious existence after death it mattered not, and wound up his argument with this conclusion: "Know well that whether in life or death no harm can come to a good man." And with this simple philosophy he composed his limbs upon his pallet and went to sleep. I think, when Bryant wrote Thanatopsis and said, "So live that when the inevitable summons shall come to take your place in the silent hall of death, go thou not as a quarry slave at night, scourged to his dungeon, but as one who wraps the drapery of his couch about him and lies down to pleasant dreams," he must have had Socrates in mind, for if ever a man did that very thing, it was this grand old pagan philosopher, a Christian by all the standards of Christian ethics.

But although it is not vouchsafed to any mortal to see beyond the grave, there are certain things about which we can have definite and positive knowledge. We know that we cannot for an instant pass beyond the purview of that divine being who has created us. We know that every hair of our head is numbered, and that even a sparrow cannot fall to the ground without the divine knowledge and consent. And we know too that, although ruling by immutable law, the supreme being is a God of infinite benevolence. No one can survey the beauties of nature by which we are surrounded and doubt that. It is only a diseased imagination or a distorted fancy that can picture the Creator as other than a loving father.

"I know not where His islands lift
  Their fronded palms in air,
I only know I cannot drift
  Beyond His love and care."

That is the normal belief of every rational human being. When Tennyson saw the body of his friend, Alfred Henry Hallam, consigned to earth, a circumstance which inspired the writing of his deathless poem "In Memoriam," he said:

"Thou wilt not leave us in the dust
Thou hast made man he knows not why,
He thinks he was not made to die,
And Thou hast made him, Thou art just."

That is a faith to which we can all reasonably adhere.

With this sure knowledge, and the faith which it inspires, death becomes the greatest event of life;

the only possible key which can unlock its mystery, the only possible door which can admit us to the knowledge of the beyond; a thing not to be anticipated nor hurried, nor for an instant dreaded, and in the fullness of time when we have outlived our usefulness to be peacefully desired.

"Sunset and evening star
And one clear call for me,
And may there be no moaning at the bar
When I put out to sea.

"Twilight and evening bell
And after that the dark,
And may there be no sadness of farewell
When I embark.

"For though from out our bourne of time and place
The flood may bear me far,
I hope to see my Pilot face to face
When I have crossed life's bar."

When the sands of life have run, and the affairs of this mundane existence fade from out earthly vision, may our uplifted eyes dimming to sights and objects long held dear catch the first faint radiance of the coming of the new day, and with our expiring breath may there break upon our glorified vision full and clear the dawning of an eternal morning.

PORTLAND CITY AND COUNTY MEDICAL SOCIETY

Pres., T. H. Coffen; Secty., R. H. Wellington

The regular bimonthly meeting of Portland City and County Medical Society was held at University of Oregon Medical School, Portland, Ore., November 3, Dr. T. Homer Coffen presiding. The minutes of the previous meeting were read and approved.

Dr. Richard B. Dillehunt presented some interesting orthopedic cases, demonstrating with moving pictures and patient a new method of stabilizing the scapula for cases of paralysis, involving the neck and shoulder muscles. Also a new method of treating scoliosis by establishing a compensatory curve of the spinal column.

Dr. W. D. McCurry presented a paper on "The Revision of the Tenth Pharmacopeia."

Dr. J. Earl Else made a motion that a committee of three be appointed to investigate the advisability of sanctioning an invitation to Dr. Engleschmidt to give to members of the society, as might elect, a course of lectures on physiotherapy. Motion was carried.

It was also moved by Dr. Else and carried that the president appoint a committee of five to investigate the feasibility of inviting the American Medical Association to come to Portland at some future date for the purpose of holding one of its annual meetings.

The second regular bimonthly meeting of the society was held at University of Oregon Medical School November 17, Dr. R. S. Stearns, vice-president. presiding. The minutes of the previous meeting were read and approved.

Dr. Frank B. Kistner presented the first paper of the evening. "Infection of the Accessory Sinuses as a Cause of Chronic Nontuberculous Bronchitis." It was followed by discussion by Drs. Ray Matson Frederick Kiehle, Ed. Labbe and Laurence Selling.

Dr. J. Earl Esle presented a paper, "Tuberculosis of the Ileum." It was discussed by Drs. R. C. Coffey, Ray Matson and C. U. Moore.

Dr. A. G. Bettman presented the approximate cost of operating a new doctors' telephone exchange either in connection with the Oregon State Medical Society or with the Nurses' Registry.

The following were elected to membership: Drs. Cecil J. Ross, Com. A. Harroun, Edwin E. Osgood.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., W. C. Woodward; Secy', O. H. Christofferson

The general meeting of King County Medical Society, Seatle, Wash., was held November 1, at 8:15 p. m., President Woodward being in the chair. Sixty-nine members were present. Minutes of the previous meeting were read and approved.

The following were elected to membership: Drs. J. M. Bowers, A. J. Bowles, A. Grinstein, H. H. Kretzler, J. A. McKay, C. Melgard and R. H. Mellen.

On motion of Dr. F. R. Underwood, it was voted that a committee on health and sanitation be appointed to confer with the city council on Cedar river contamination.

Dr. Karshner, of Puyallup, discussed legislative problems at Olympia. He gave a graphic description of his "excellency," the Governor, and what he did with the basic science bill.

The paper of the evening was by Dr. L. H. Jacobson on "Early Syphilis, Diagnosis, Prognosis and Treatment." Although syphilis is one of the most prevalent diseases, few papers on this subject have been discussed before this society. For the diagnosis of the primary sore early and frequent dark field examinations are advised. A negative dark field does not exclude syphilis, since the spirochetes may not be found because of faulty diagnosis or previous use of antiseptics. The Wassermann should always be considered a confirmation test. A single negative cannot exclude syphilis nor should a diagnosis be made on a single positive Wassermann without confirmatory evidence. It has been proven that 36 per cent of cases become blood Wassermann positive before the tenth day, while some may become positive as early as the third or fourth day. A cure or an arrest may be obtained in 90 to 95 per cent of all early cases treated for a sufficiently long period of time. The abortive treatment, its eradication by short intensive treatment, is not justifiable unless the rules laid down by Dennis are complied with. Murcury is being supplanted by bismuth. It is said to be ranked next to the arsphenamines. It is too early to state as to the permanency of its results. To determine the permanency of curative treatment, most authorities are agreed that each case should be treated for at least a year after clinically and serologically free of symptoms.

The paper was discussed by Dr. Whitlow, who stated the dark field illumination test is too much ignored. He approved the use of bismuth, stating that potassium iodide is not as beneficial as has been accredited. Major Lovewell, of Ft. Lawton, stated that no syphilis was reported at that station during October. Prevention of syphilis is the aim in the army, and prophylactic stations are useful for this purpose. Dr. Ristine endorsed arsphenamine in treatment positive Wassermann.

A report was presented by Dr. A. H. Peacock on behalf of the legislative committee which was approved and ordered filled.

A meeting of the medical section of King County Medical Society was held November 8 at 8:15 p. m., with President Palmer in the chair.

The first paper was read by Dr. Charles E. Sears, of Portland, Ore., on "Medical Phases of Goiter." Attention was called to the generally accepted classification of thyroid disorders adopted by the Mayo Clinic. The incidence of exophthalmic goiter is independent of other types and, occurring in all countries independent of so-called goiter areas, it is probably a distinct disorder by itself. The use of iodine, especially in exophthalmic goiter, was discovered years ago. Its use and the futility of digitalis in this condition was lost sight of until Plummer, in 1923, resurrected these observations. Iodine should be given until the last minute before and should be resumed promptly following operation. It has been shown that the use of digitalis may actually increase mortality, so that it is now withheld from goiter patients and used only when cardiac insufficiency is present. Quinidine probably has no value at all. Stress was laid on the importance of coordination of internist and surgeon, both in preliminary and postoperative treatment.

The second paper was by Dr. H. B. Thompson on "Treatment of Goiter from the X-Ray Standpoint." At the meeting of the Radiologist's Association of North America, results were presented in treatment of goiter from the x-ray standpoint which compare favorably with surgical results. While surgical treatment is speedy, and has a psychologic advantage, x-ray treatment presents absence of shock, mortality, disfiguring scar and definite control of dosage. Authorities were quoted presenting permanent cures by x-ray treatment. Ideal treatment places the patient under the control of an internist, cooperating closely with the radiologist and surgeon. A classification from the radiologic standpoint was presented with a description of each. The writer stated that x-ray treatment offers as large a percentage of cure of exophthalmic goiter as does surgery.

PIERCE COUNTY MEDICAL SOCIETY

Pres., E. F. Dodds; Secty., W. B. Penney

A regular meeting of Pierce County Medical Society was held in its rooms, Tacoma, Wash., November 9. The meeting was called to order by the president, Dr. E. F. Dodds, who appointed Dr. J. B. Robertson secretary pro tem. Minutes of the previous meeting were read and approved.

Mr. Harley Simmons was introduced by Dr. Dodds and gave a talk relative to the oncoming community chest drive. He urged that the physicians lay aside all personal animosities to the cause and give it their unanimous financial support.

In line with the request of the state medical association that we prepare ourselves to make examinations of the healthy individual, Dr. J. S. Davies gave a paper on the general examination of the eye, ear, nose and throat. Dr. Davies said that every physician should have at least a head mirror and know how to use it, and should know the normal structures to be examined so as to judge the degree of abnormality found. He warned against hurting the patient.

Beginning with the mouth he urged us to inspect thoroughly the teeth and the pillars of the fauces. The pillars often reveal a bad condition of a small tonsil. Catarrh of the throat is generally evidence of nasal abnormality. Dr. Davies said that, if the nasal septum is perforated, look out for syphilis or tuberculosis. The worst deflections of the septum may be those high up which shut off free drainage from the antrums and the sinuses. The antrums and sinuses may be examined in a dark room by transillumination.

In examining the ear first syringe out the cerumen. The otoscope is preferable in ear examinations to the head mirror. The hearing can be tested by the human voice and the degree of accuracy expressed in twentieths. The general examination of the eye may be supplemented by Snellen's type test and the results expressed in twentieths.

This paper was freely discussed by Drs. W. G. Cameron, T. B. Murphy, W. H. Ludwig, C. V. Lundvick, A. W. Howe, I. P. Balabanoff, J. R. Turner and J. S. Davies.

Dr. Davies and other eye men present gave a demonstration of the examination as outlined in the above paper. This was much appreciated by all present.

There being no further business, the meeting adjourned.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Pres., E. F. Chase; Secty., M. J. Morriss

The monthly meeting of Puget Sound Academy of Ophthalmology and Oto-Laryngology was held at the St. Helen's Clinic, Tacoma, Wash., November 16. Dr. Chase called the meeting to order at 8:00 p. m.

Dr. A. E. Hillis presented the case of a boy six years old who had a central, congenital cataract in each eye. Dr. Wurdemann brought out the fact that, although his vision at this age is fair, as he grows older and his pupils get smaller, his vision will decrease. For this reason discission should be performed.

Dr. D. H. Bell presented three cases, the first that of a man with mucocele of his left frontal sinus. He had complained of headaches and discharge from his nose. There was a marked predominance of the left side of the forehead and transillumination showed it clear, an enormously enlarged frontal sinus with absorption of the bone of the outer wall.

His second case was a boy upon whom he had performed a Mule operation with insertion of a glass ball in the eviscerated eyeball.

The other case was that of buphthalamos or juvenile glaucoma.

Dr. J. A. Johnson presented a child four years old with a tumor on the eyeball. It was yellowish in color, not inflamed, conjunctival tumor freely movable, undoubtedly a lipoma.

Dr. C. V. Lundvick presented a case of primary acute glaucoma in an elderly lady. It was of about forty-eight hours duration with the classical features of acute glaucoma, including cupping of the disc.

He also showed a fracture of the orbit with injury to the eyeball. The fundus of that eye showed edema of the retina and three small hemorrhages now fading.

There being no further business to come before this meeting, the same adjourned at 9:45 p. m.

PUBLIC HEALTH LEAGUES

HEALTH BILLS TO BE PRESENTED AGAIN

According to present plans two major health bills will be offered to the next legislature. The Basic Science Bill, which fell only three short of passing over the governor's veto, will again start its journey in the Senate in the early days of the session. The Law Enforcement Bill which moved along through both houses last time with heavy majorities, but received a set back by gubernatorial opposition, will be pressed forward in the effort of getting the necessary two-third's vote despite the veto. This latter measure was rejected by the governor after the adjournment of the legislature and was therefore held over to the coming session, which opens on January tenth.

The Basic Science Bill provides machinery for an examination of all healing applicants in the subjects fundamental to all branches of practice. Physiology, anatomy, chemistry, pathology and hygiene are established as subjects and an examination in these is required before an applicant for license can take his regular examination. This proposal has been widely endorsed in Washington. The medical, dental, pharmacy professions, as well as the nurses organizations and the powerful federation of women's club have asked for its passage.

The Law Enforcement Bill gives over the enforcement parts of the professional acts to the attorney general, leaving only the clerical and examination features of these acts to the director of licenses. It is believed that an aggressive campaign of law enforcement, with the full utilization of the legal machinery of Washington, will do much to relieve the state of a horde of unlicensed practitioners, as well as check the operations of those who are practicing medicine under the cloak of restricted licenses.

WEARING WILSHIRE'S COLLAR

Andy Gump said one time that he would "wear no man's collar," but from reports given the League office there are a large number of Andy's friends who are accepting the collar of Gaylord Wilshire, late real estate operator of Los Angeles. Mr. Wilshire represents that he is the "inventor" of a magnetic collar and he has opened shops in Seattle, Tacoma and Portland, where these collars may be obtained for $58.50 cash, or $65 in terms. He is said to be doing a thriving business.

Mr. Wilshire in his advertising and in his radio talks states that he has built up a magnetic field, based on the discovery of Professor Warburg of Germany, and this field aids the blood stream, resulting in better health. In fact, quite a list of diseases are mentioned in the literature which are greatly aided by this wire healing.

The Public Health League officers asked the Better Business Bureau of Seattle for an investigation. A committee of nine men were chosen to examine into the claims of Wilshire. A report was filed with that bureau on November 18, in which it was declared that this belt had "no therapeutic effect," that the iron in the blood cannot be influenced by an electromagnetic field and that Mr. Wilshire's statement that his belt had "about a mile of wire in it" was short to the extent of "about a half a mile of wire."

One of the interesting features of the report filed was that which showed the cost of materials in the "magnetic" collar or belt. The total cost of this wire contraption, in the materials used, was stated to be just $5.75! This would indicate a profit of something over 800 per cent on each sale. It is believed that further successful advertising of this electric product will be greatly hindered by the investigation made, and in all probability the full report of the fact-finding committee will appear in some of the papers of cities where operations are being carried on.

Five Year End-results in Treatment of Cancer of Uterine Cervix. In ten years Frank W. Lynch, San Francisco (Journal A. M. A., Nov. 20, 1926), has treated nearly 250 cancers of the cervix. One hunhundred and ninety-two of these were treated with radium alone, or by operation, usually with preliminary or postoperative irradiation. The roentgen-ray has been used as an adjunct in some of the cases since 1923. One hundred and fifty of the 192 have passed a three year period of observation. The five year series consists of 107 patients, treated between March, 1916, and March, 1921, with radium or surgery. Of fifty-nine inoperable and borderline cases in which treatment was by radium only, fifty-three are dead, fifty-one of these of cancer. Forty-seven died within three years. Only five are alive and well, after five years. In twenty-three cases, radium was used for prophylaxis or for recurrence after nonradical operations elsewhere. Twenty-three of these patients are dead of cancer, twenty-one died within three years, two died after three or four years. None are alive and well after five years. Lynch concludes that no method has yet cured 50 per cent of cervical cancers. The ordinary panhysterectomy has no place in the treatment of cervical cancers. Better results will be obtained by irradiation in all cases that are not suitable for truly radical surgery. The literature does not indicate that radium is likely to cure in more than a scant majority of the so-called operable cases.

BOOK REVIEWS

Edited by **KENELM WINSLOW, M.D.**

MODERN CLINICAL SYPHILOLOGY. By John H. Stokes, M. D., Professor of Dermatology and Syphilology in the School of Medicine, University of Pennsylvania, etc. Octavo of 1444 pages with 885 Illustrations and Text Figures and More Than 200 Detailed Case Histories. Philadelphia and London: W. B. Saunders Company, 1926. Cloth, $12.00 net.

In this work of Stokes we have the most valuable contribution to clinical syphilography in recent years. As the knowledge of syphilis in its protean manifestations is equivalent to knowledge of the whole domain of medicine, the success of his work in covering such an enormous field is marvelous. The posibility of attaining this end was the cooperation of various confreres at the Mayo Clinic, from which much of the material in this book is derived.

This work will prove of great value to those engaged in almost any department of medicine, its range is so vast. For internists it will be a necessity. The chapters on syphilis of the gastrointestinal tract, on the liver and spleen, on the cardiovascular system and central nervous system are unrivaled, so great is their practical worth. It is essential to emphasize that this book is absolutely clinical, and the enormous number of patients available at the Mayo Clinic has enabled the writer to illustrate profusely by case histories the newer points in reference to treatment and diagnosis. These histories are not mixed up with the text but may be found at the close of the chapter, or are kept distinct, so as not to interrupt the thread of discourse. The work in a way suggests Cabot's remarkable treatise on differential diagnosis in its deductions from actual experience with living and dead patients.

The number of cases of syphilis of the liver and spleen is astonishing and many useful points are brought out. In the first place, the exact mimicry of cholecystitis and gallstone trouble in luetic perihepatitis is shown, and the numerous diagnostic mistakes and harmful operations resulting. The danger in beginning treatment with salvarsan or neosalvarsan, and the harm in tapping ascites in the presence of a syphilitic liver are brought out. It appears that in syphilis of the liver and ascites limitation of fluid intake and the use of hydrogogue cathartics may lead to recovery, with specific treatment, whereas frequent tapping may often cause a fatal ending. The interesting and confusing matter of jaundice, following or preceding the use of salvarsan in syphilis, is most ably handled by Stokes who has already published his views on the subject. No condition requires more knowledge and judgment as to diagnosis and treatment than that of jaundice in the presence of syphilis, as in some cases arsphenamine may cure and in others it may kill. Equally illuminating are the discussions of cardiovascular, gastrointestinal and nervous syphilis, so that one wonders how a dermatologist may at the same time be an apparent specialist in all these departments of medicine or, even better, a rarely gifted internist. No better or clearer description of the diagnosis of early cardiovascular syphilis can be found.

All through the work will be seen summaries on the subjects discussed in smaller print enclosed in deep black lines like a picture frame. These are particularly valuable because the author does for the reader what he would inevitably have to do for himself in order to retain the essential points in his mind. But perhaps the most useful part of the volume is the debate on the newer remedies and the discrimination in their use, or the sequence in which they should be given. Thus, the role of bismuth, sulpharsphenamin, tryparsamine; the administration of large or small doses of iodide; whether the sodium or potassium salt should be given, and whether by mouth or intravenously. The therapeutics of syphilis alone has become so vast a subject that proper discrimination is essential and even a vital matter. This book is a tremendous success and the author is to be envied and congratulated. None of us can afford to be without it, as it is too extensive to be memorized.

WINSLOW.

THE OPHTHALMIC YEAR BOOK. Vol. XXII. Containing Bibliographies, Digests and Indexes of the Literature of Ophthalmology for the Year 1925. Edited by William H. Crisp with Collaborators. 315 pp. Ophthalmic Publishing Co., Chicago, 1926.

This is a concise digest of the current literature of ophthalmology published during 1925. The study of the eye is the oldest and most highly developed specialty in modern medicine but even after several generations of intensive research work on this small organ we find that each year brings forth a vast amount of new literature on the subject. The editorial staff, composed of thirty-four leading ophthalmologists, has included in these abstracts only those which contain material of permanent value, yet these number thousands. Considering that this relates to only one small organ of the body and that thousands of earnest workers are doing just as intensive work in other specialties, one realizes the complexity of the human machine and the vast field for exploration afforded the student for years to come.

It is difficult to reconcile the amount of research being done in medicine with the indifference and ignorance of the same public that receives the benefit of this work. They rush out with open arms and pocket books to hail each new charlatan who claims to have solved the riddle of the human body and to have discovered a cure for all its ills. They believe him implicitly when he guarantees to cure —cash in advance—everything from adenoids to hemorrhoids; from bald heads to flat feet, and all diseases in between. Meanwhile the medical investigators plod slowly but faithfully on, each digging away at some phase of one small branch of the great science of medicine, each adding his mite of wisdom until the whole constitutes a great store of knowledge.

This digression may seem extraneous to a book

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review but it is prompted by the impression one gets that this is not simply a book, but rather a monument, commemorating another year's advance toward the goal of exact medical science. The reviews, as in previous volumes, are grouped in appropriate chapters, making it easy for the reader to locate the subject he wishes. Each review is necessarily limited to a few sentences but these contain the meat of the paper and the accompanying bibliography tells where the original paper may be found.

BRUGMAN.

PRACTICAL MATERIA MEDICA AND PRESCRIPTION WRITING. With Illustrations by Oscar W. Bethea, M. D., Ph. G., F. C. S., Professor of Clinical Therapeutics, Tulane, Fourth revised edition, 498 pp., $4.50, F. A. Davis Company, Philadelphia, 1926.

This volume presents all the necessary information for the art of prescription writing. Part I includes all official drugs conforming to the tenth edition of U. S. Pharmacopoeaia. Drugs that have fallen into the disuse have been omitted and much new material has been added. The drugs appear in alphabetical order with discussion of each. Many are accompanied by prescriptions suggestive of their use, being copied from standard medical works. Part II is devoted to prescription writing. Many valuable suggestions are presented as to the correct arrangement of drugs, proper use of Latin, advisable directions to the patient and other essential details. Part III contains thirty-one prescriptions, arranged to illustrate common errors of prescription writing. Each is accompanied by a correct prescription eliminating errors of the first. This book is well worth the attention of anyone wishing to perfect himself in prescription writing.

LECTURES ON NUTRITION. A series of lectures given at the Mayo Foundation and the Universities of Wisconsin, Minnesota, Nebraska, Iowa, and Washington (St. Louis) 1924-25. 12mo 243 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1925. Cloth, $2.50 net.

This small volume comprises a series of lectures presented during 1924-25, including a large portion of recent research work in the field of nutrition, the lecturers being the persons who conducted or were responsible for the research work. They deal with the principles and problems of metabolism presented from several angles by the different writers. McCollum reviews our present knowledge of the vitamins. Evans offers an interesting discussion of relations between fertility and nutrition. One will find much valuable information in this book.

THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume VI, Number IV (Mayo Clinic Number—October, 1926). 274 pages with 91 illustrations. Per Clinic year (February, 1926, to December, 1926). Paper, $12; Cloth, $16 net. Philadelphia and London: W. B. Saunders Company.

This volume from the Mayo Clinic presents many interesting and valuable reports, as is to be expected from that source. Surgery of most of the organs is included among the cases reported. Judd and Paker report on mortality following 1324 operations on the biliary system and pancreas in 1925. The mortality rate in 1923 was 4.14, in 1924, 3.21, in 1925, 2.94. During the latter year the number of operations exceeded either of the two preceding years. The cases are classified under various headings, several especially interesting cases being given in detail. Figi reports 12 cases of actinomycosis of the tongue, a condition which is ordinarily considered very rare. Most of these are reported in detail as to diagnosis, symptoms and treatment. There are numerous interesting clinics discussed, dealing with surgery of the gallbladder, intestinal tract, genitourinary system, as well as diseases of the heart and blood vessels.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other mouth.) Volume X, Number III, (Mayo Clinic Number, November, 1926.) Octavo of 275 pages with 55 illustrations. Per Clinic year, July, 1926, to May, 1927. Paper, $12.00; Cloth, $16.00 net. Philadelphia and Loudon: W. B. Saunders Company.

This volume contains a large number of interesting clinical reports from the many medical men in the Mayo Clinic, only a few of which can be mentioned. Jacobs and Keith report three cases of cardiac edema, which condition they find most satisfactorily controlled by an acid-producing salt and organic mercury compound. They prescribe ammonium nitrite or ammonium chloride with merbaphen (novasurol). This combination has proved a successful and satisfactory diuretic. Idiopathic hypertension is considered by Johnson and Adams in a report of three cases. All of the patients had foci of infection. In many cases they find that prolonged rest alone will lower elevated blood pressure. Nitrites and luminal have proved of value in this condition. O'Leary describes secondary types of pellagra with a report of five cases. They all had this disease beside an organic lesion in the gastrointestial tract. This was considered a factor in the production of the pellagra secondary to this primary condition, and its removal permits of cure of the pellagra. Parsons, Randall and Wilder give detailed treatment of two cases of pregnancy and diabetes, both of moderately severe character. The successful completion of pregnancy was attributed to the insulin treatment.

THE MEDICAL RECORD VISITING LIST FOR 1927. Contents: Calendar, July 1926-June 1928. Estimation of Probable Duration of Pregnancy, Approximate Equivalents of Temperature, Weight, Capacity, Measure, etc. Maximum Adult Doses by the Mouth, in Apothecaries' and Decimal Measures. Drops in a Fluid Drachm. Solutions for Subcutaneous Injection. Solutions in Water for Atomization and Inhalation. Miscellaneous Facts. Emergencies. Artificial Respiration. Signs of Death. Hints on the Writing of Wills. Table of Signs. Visiting List with Special Memoranda. Consultation Practice. Obstetric Engagements. Record of Obstetrical Practice. Record of Vaccination. Register of Deaths. Nurses' Addreses. Addresses of Patients and others. Cash Account. Prices for 30 patients per week, $1.75; for 60 patients, $2.00; for 90 patients, $2.50. Name stamped in gold, 25 cents extra; name and address, 50 cents extra. William Wood & Co., New York.

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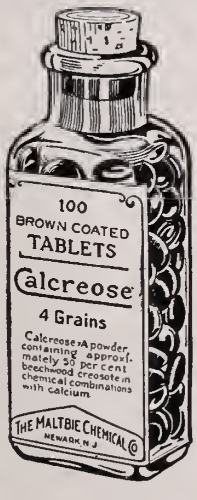
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Whole Milk	10 ounces
Cold Water	20 ounces
Casec (2 envelopes)	⅔ ounce

Mix the CASEC with enough of the cold water in a cup to make a thin paste. Add the paste to the balance of the water, pour in the milk, and heat the mixture over a slow flame to the boiling point, stirring constantly to avoid lumps. Allow the mixture to boil actively for 1 minute, remove from stove, cool, and divide into bottles sufficient for the 24-hour feeding.

Suggested Amounts to Be Given at Each Feeding Are as Follows:

Age Months	*Ounces Each Feeding*	*Number of Feedings in 24 Hours*
1	2 to 3	7
2	3 to 4	7
3	4 to 5	7
4	5 to 6	6
5	5 to 7	5
6 to 9	6 to 8	5
9 to 12	7 to 9	5

Infants under Four Pounds may require 8 feedings, 2 ounces each, in the 24 hours

In two or three days add 1 level tablespoonful of *Dextri-Maltose* No. 1, and increase one tablespoonful every other day until the baby is taking 5 or 6 level tablespoonfuls of *Dextri-Maltose* in the 24-hour Casec feeding.

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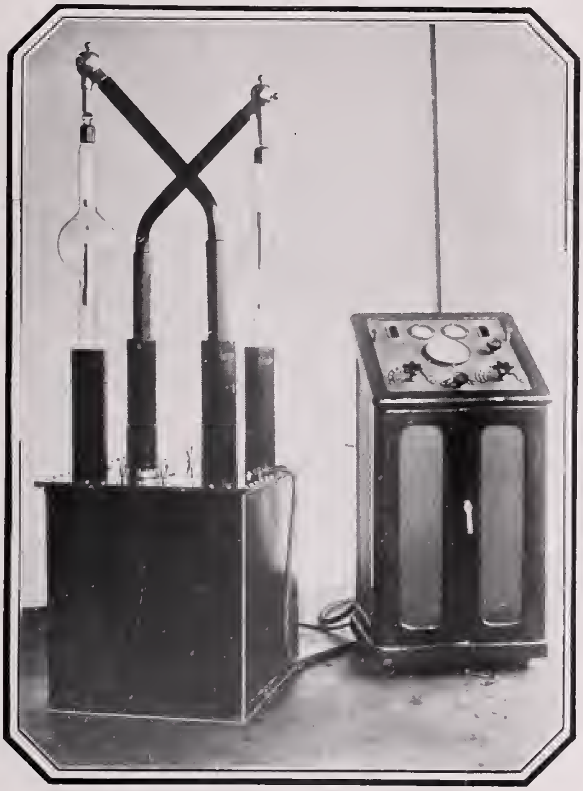

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